

*Directorate General of Health Services*  
Government of India

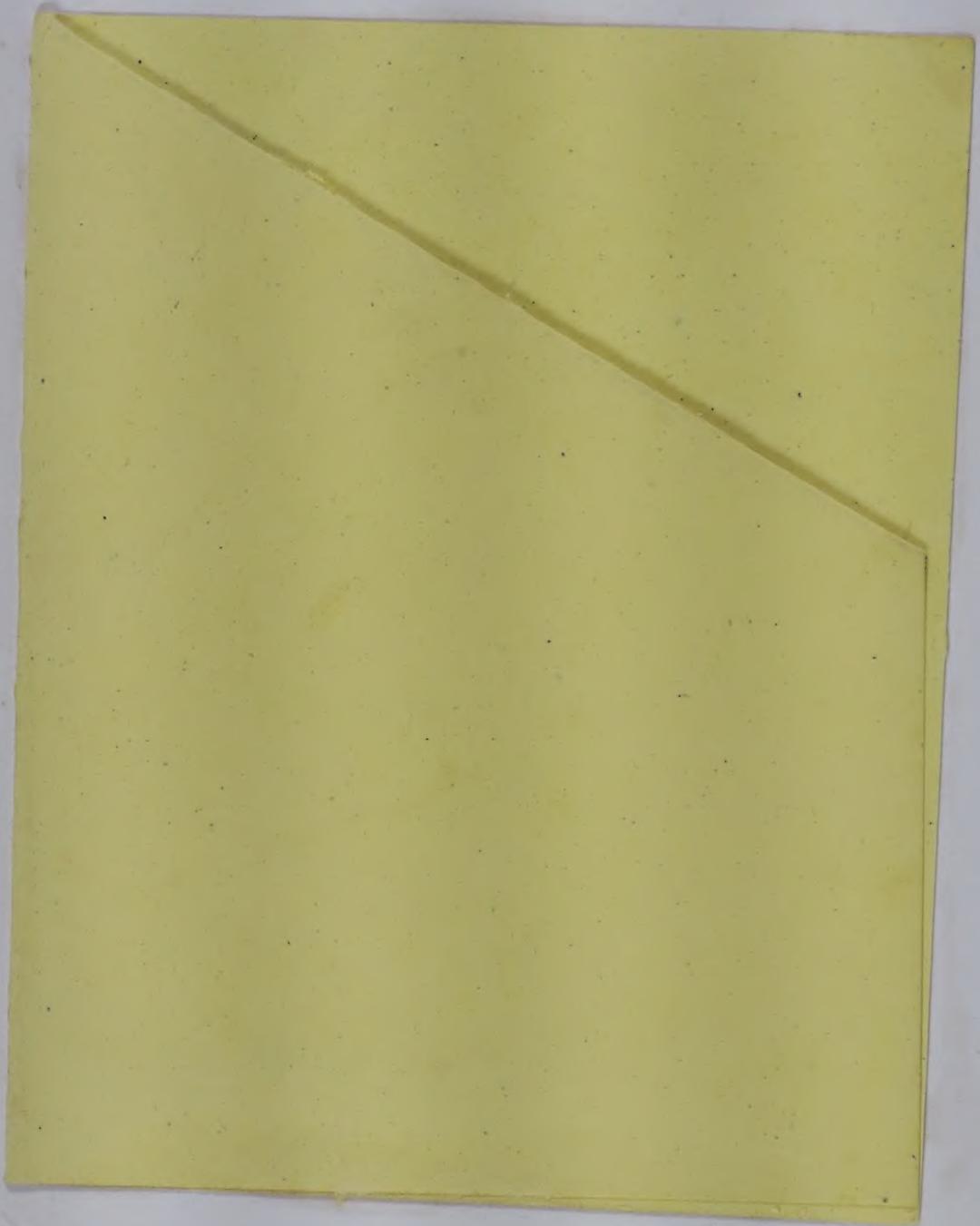
# **Proceedings of WHO/NICD Workshop on Serosurveillance of AIDS**

November 16-19, 1987



**National Institute of Communicable Diseases**  
22-Shamnath Marg  
Delhi 110054

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**PROCEEDINGS OF WHO/NICD WORKSHOP  
ON  
SEROSURVEILLANCE OF AIDS  
(November 16-19, 1987)**

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## P R E F A C E

Acquired immunodeficiency syndrome (AIDS) has emerged as one of the most gruesome and dreadful diseases of human being and has evoked widespread alarm not only in the medical profession but also among the general public. Realising the emergent need, Government of India launched a massive campaign for surveillance of AIDS across the country in April, 1986 when first few cases of HIV antibody positives were detected in Tamil Nadu. Promptly, a Central AIDS Cell was established in DGHS for coordination of National AIDS Control Programme through State health authorities. A network of 33 surveillance and 4 AIDS reference centres were established in various parts of India. Appropriate arrangements were also made by the Government to equip these laboratories fully and to provide training to their manpower so as to undertake the surveillance programme efficiently.

A great deal of success has been achieved during the last eighteen months of AIDS surveillance. However, strong need was felt to bring the representatives of each centre on a national platform so as to compile, review and analyse the national data gained so far to discuss the problems faced during AIDS surveillance and finally to reach conclusions and make recommendations for the forthcoming year in view of strengthening the existing machinery. Since National Institute of Communicable Diseases is known for its leading role in such training, teaching and review programmes

pertaining to various communicable diseases, it gladly volunteered to organise the present workshop on Surveillance of AIDS in India.

This publication provides the details of technical deliberations and presentations made during the four-day meeting. The initial chapters constitute a series of guest lectures by distinguished scientists in the field, followed by reports presented by each centre and finally the major conclusions and recommendations arrived at the closing session of the meeting.

The workshop has been a collective effort of a number of our learned colleagues, especially Dr. Ira Ray, Dr. S.P. Tripathy, Dr. K.K. Dutta, Dr. P. Ramachandran, Dr. B.B. Gaitonde, Dr. S. Pattanayak, Dr. K.B. Banerjee and Dr. Roger Feldman. Financial support to organise the workshop was liberally extended by WHO.

Inspite of this, the workshop would not have been successful without the whole-hearted support extended by Dr. R.L. Ichhpujani, Dr. Shashi Khare and Dr. D. Chattopadhyay both before and during the proceedings. Last but not the least, we place on record our sincere thanks to Dr. P.N. Sehgal, Director NICD, for his constant encouragement and guidance for smooth conduction of this workshop.

**S. KUMARI**  
Dy. Director & Head  
Microbiology Division

## **WELCOME ADDRESS**

Ever since the reporting of the first confirmed evidence of AIDS infection in 6 Indian women prostitutes from Tamil Nadu in 1986, Govt. of India drew up a national strategy for control of AIDS. A Cell was established in the Directorate General of Health Services to co-ordinate the work related to AIDS. Surveillance machinery was geared - up and Surveillance Centres were established in different States and Union Territories of the country. There are 33 such surveillance centres in the country today. NICD is one of the 4 referral centres in the country. NICD brought out a book on AIDS for the awareness of the health professionals much before the first evidence of infection in the country came forth. NICD conducted training courses both for the epidemiologists and laboratory personnel, which helped in the surveillance of AIDS. The laboratory course was facilitated along with the officers by NICD, by Dr. Pavri and her staff from NIV, Pune and two consultants from CDC, Atlanta, USA. Over 50,000 serum samples from the various high risk groups have been tested thus far. A need was felt to compile the national level data and draw important conclusions regarding the epidemiological profile of this dreaded disease in India.

This is precisely the objective, for which Ladies and Gentlemen you all are here today. I welcome you all and wish you a comfortable and fruitful stay at NICD. I am sure the recommendations and conclusions arrived at by your deliberations over the next four days shall go a long way in further streamlining the AIDS surveillance in the country and might alleviate the "AIDS-problem" from the mind of general public and health professionals.

With these words, I once again welcome you to this workshop.

**P N SEHGAL**  
**DIRECTOR**  
**NICD**

## COURSE OBJECTIVES

National strategy for control of AIDS which was drawn subsequent to the first reported evidence of AIDS in India in April '86, is now over one year old. During this time there has been establishment of 33 surveillance centres and 4 referral centres for screening and diagnosis of high risk groups for evidence of AIDS infection in the country. This in itself is no mean achievement. But a strong need was felt to have the representatives of all the surveillance centres together and discuss the strong and weak points of the programme.

The objectives of this 4-day workshop are:

1. To review, compile and disseminate the knowledge gained during the past one-year of AIDS surveillance in the country.
2. To discuss problems faced in the surveillance programme and steps to remove them.
3. Define future approach in selection of high risk groups.
4. To discuss about the legal and social aspects of the disease and reporting and follow-up of the cases.
4. To make recommendations and prepare guidelines for the future action.

**S. KUMARI**  
Dy. Director & Head  
Microbiology Division  
NICD

## INAUGURAL ADDRESS

Human immunodeficiency virus the cause of AIDS, now has infected more than a million people in the United States of America alone and millions more in other countries. The cases of AIDS reported thus far are only the beginning of the expected toll, the epidemic is growing every day, partly because persons who may not know they are infected are spreading the virus. The number of full-blown cases of AIDS, a disease identified as late as in 1981 has swollen over 65,000 in the world today. Keeping in view the rapidity of travel from one continent to other, the disease is not expected to remain confined to any single geographical area. Thus Govt. of India became vigilant and entrusted ICMR in 1985 to undertake surveillance for AIDS through establishment of diagnostic capabilities and screening of high risk groups for AIDS and alerted all state health authorities including hospitals. In April, 1986, on finding the first confirmed evidence of AIDS infection from Tamil Nadu, Govt. of India drew up National Strategies for control of AIDS. A cell was established in the DGHS to co-ordinate the work related to AIDS. The surveillance machinery was then expanded and augmented. Today we have 37 AIDS surveillance centres functioning in the different States and Union Territories of India. Training programmes for health professionals were arranged both nationally and internationally. Diagnostic reagents were procured and distributed. Health - education materials were used through different media to make the general public aware about this disease. Health professionals were made familiar with the Do's and Don'ts of the disease. All this was done, not because there were many AIDS cases in the country but to remain vigilant about this disease, develop our diagnostic

and surveillance capabilities for AIDS and derive collateral benefits from the programme which might help in lowering the infection with hepatitis B virus.

For proper surveillance of any disease specific, sensitive, reliable and reproducible diagnostic tests are a must. This is particularly more true for a disease like AIDS, which bears such a social engima, that one has to be doubly sure, before labelling any one as AIDS positive. It is in this area, that I shall like to draw the attention of all the Surveillance Centres, which should make use of the confirmatory service available at the 4 Referral Centres (NICD, Delhi, AIIMS, New Delhi, NIV, Pune and CMC, Vellore) before declaring any case as positive.

Ladies and Gentlemen, we have reached a stage in the AIDS surveillance programme where we need to sit together and look back at the gains and deficiencies of the programme. Works and ways and means to streamline the surveillance programme to avoid duplicating the research, and make available the specific and sensitive diagnostic facilities at each State/UT level.

We shall be keenly looking forward to the recommendations and conclusions arrived at by you, at this 4 day workshop.

With these words, I have great pleasure in inaugurating this Workshop.

Thank you,

Read on behalf of  
**G K VISHWAKARMA**  
Director General of Health Services  
Government of India.

## GUEST LECTURES



## SURVEILLANCE AND GLOBAL TRANSMISSION PATTERNS OF AIDS

J. Chin  
World Health Organisation

### INTRODUCTION

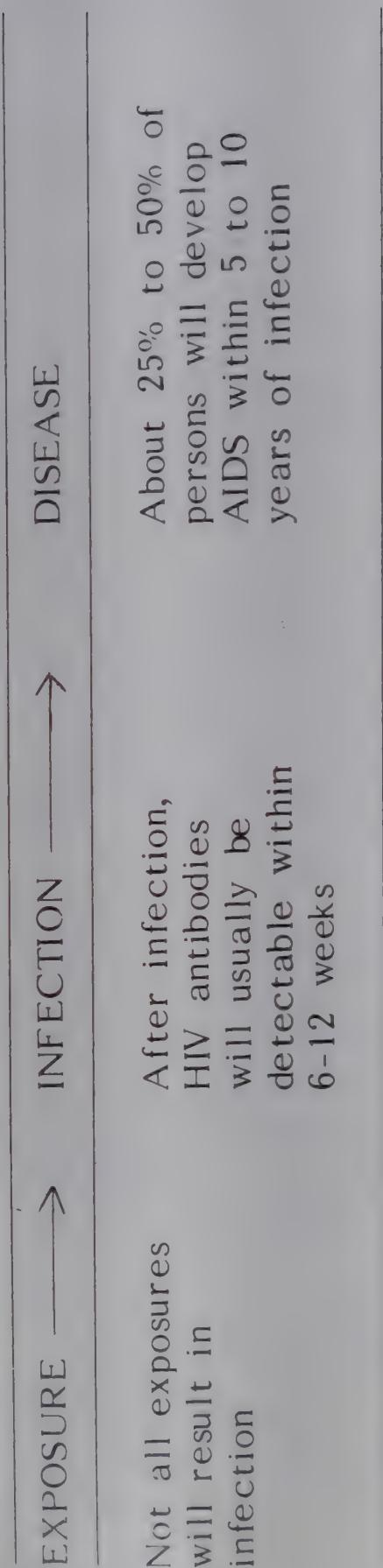
AT the present time, it is accepted that AIDS is a worldwide problem. However, from its initial recognition in 1981, this pandemic has been characterized by dental and gross underestimation of its potential magnitude. It is now apparent that this pandemic is an unprecedented threat to global health; it is in its early stages, and its ultimate dimensions are difficult to estimate. From our current knowledge of AIDS, we can confidently predict that further spread is inevitable and the global situation will get much worse before it can be brought under control.

The following presentation will describe the basic epidemiology and natural history of HIV infections and AIDS. Emphasis will be given to describing the mode(s) of HIV transmission and to the problems attendant to the identification and diagnosis of HIV infection and the clinical manifestations due to such infections. In addition, the current global patterns of HIV infection will be presented.

### Epidemic Terms and HIV Infection

Exposure, infection and disease are epidemiologic terms with specific meanings which are often confused when referring to HIV infection and AIDS

**Figure 1.** Natural history of HIV infection.



\* Whether "cofactors" (such as genital ulcers) will predispose some persons to be more susceptible to infection after exposure or to progress more rapidly after infection to develop AIDS is not known.

• (Figure 1).

**Exposure** . The physical contact to an infectious agent in such a manner as to enable infection to occur.

Not all such exposures to an infectious disease agent will necessarily result in infection.

Subsequent tables will show the relative risk of HIV infection following different types of exposures.

**Infection** . The entry and subsequent replication of an infectious agent in a biologic host.

Infection with HIV can be detected by the presence of specific antibodies. Such antibodies are usually detectable within several weeks to several months after exposures which result in an infection. The time from infection till the appearance of detectable antibodies is referred to as the "Window period". Infection can also be detected by isolation of HIV or by the detection of specific antigens of HIV.

**Disease** . Clinical signs or symptoms which are due directly or indirectly to a disease-causing agent.

In general, a disease is associated with specific signs and symptoms which when present enables a clinical diagnosis to be made. A syndrome is a constellation of some specific and some non-specific signs and symptoms, some combinations of which when present enables a clinical diagnosis.

As of late 1987, it is not precisely known what proportion of HIV-infected persons will eventually develop AIDS, but one estimate based on observations of groups of infected persons over time suggests that about 25% to 50% may develop AIDS within

a 5 to 10 year period.

## **Natural history of HIV Infection**

1. HIV attacks the T4 helper lymphocyte (white blood cell), which is essential for coordination of the body's cellular immune system.
2. HIV infection is likely lifelong and in an increasingly large proportion of persons (from 25% to 50% or more) results in a progressive destruction of the cellular immune system.
3. After sufficient immune damage occurs, the person is then susceptible to many opportunistic infections and rare malignancies.
4. These infections and cancers are the indirect (surrogate) markers of the underlying acquired immunodeficiency caused by HIV. On average, it may take 8 to 9 years from infection to such severe or irreversible immune damage.

## **Clinical Stages of HIV infection**

Table 1 outlines the clinical stages of HIV infection and their definition or diagnosis.

1. Shortly after HIV infection (usually a few weeks to a month or two), an as yet undefined proportion of persons may develop an acute glandular fever-like illness, following which HIV antibodies become detectable in the blood.
2. Aside from possible acute illness which may occur shortly following infection, HIV infected persons are then generally free of any clinical signs

and symptoms for about two or more years.

3. After a variable period of an asymptomatic infection, some persons may develop generalized lymphadenopathy. In addition, other general non-specific symptoms may also appear including tiredness, night sweats, diarrhoea, and infections such as herpes simplex and oral candidiasis. These latter signs and symptoms have been referred to as AIDS related conditions (ARC), but no uniform or accepted definition of ARC currently exists.

4. Clinical signs and symptoms referred to as ARC usually, but not always precede the clinical stage of HIV infection, i.e. AIDS.

### **Definitions of AIDS for Public Health Surveillance**

Table 2 outlines the current surveillance definitions of AIDS. The definition of AIDS has been changing as documentation of the wide spectrum of clinical manifestations, due to HIV, has accumulated, and as laboratory tests to detect HIV infection and immune deficiency are developed.

The initial definition of AIDS developed by the US Public Health Service (CDC, Atlanta) in 1982 relied on the diagnosis of diseases such as opportunistic infections (Pneumocystic carinii pneumonia) or rare malignancies (Kaposi's Sarcoma) which are indicative of the underlying immune deficiency caused by HIV. In addition known causes of immunodeficiency had to be ruled out.

In late 1987, this definition, which was accepted for global surveillance by WHO, was revised to place greater emphasis on HIV infection status to include additional indicator diseases and to accept presumptive diagnosis of some of the indicator

Table 1. Clinical stages of HIV infection.

Clinical Manifestations	Period after infection	Cellular Immune status	Definition/Diagnosis
1. Acute mononucleosis-like illness (fever, rash)	Several weeks to a month or two	Normal	Acute HIV infection
2. None	Variable - some persons may remain asymptomatic for many parts, perhaps life	Likely ranges from normal to moderate deficiency	Asymptomatic HIV Infection
3. Lymphadenopathy, fatigue night sweats, diarrhoea, Frequent infections	Variable - months to years	Ranges from moderate to severe deficiency	AIDS related Conditions (ARC)
4. Opportunistic infections, Certain malignancies, Encephalopathy, Wasting Syndrome	Variable - can be as short 6 months but usually several Years. The mean incubation period about 8-9 years.	Severe or Irreversible deficiency	AIDS

Table 2. AIDS definitions for Public Health Surveillance.

A. CDC/WHO Surveillance Definition

1. Initial definition 1982 - 1987

- A reliably diagnosed (i.e. by culture or histology) disease moderately indicative of an underlying cellular immune deficiency. About 12 indicator diseases were originally specified
- No known underlying cause of immune deficiency

2. Definition revised in late 1987

- Greater emphasis placed on HIV infection status
- Additional indicator conditions included
- Presumptive diagnosis accepted for some indicator diseases

B. WHO Clinical Definition for Adult AIDS in Africa in 1985

- Diseases indicative of the underlying immune deficiency can be diagnosed solely by clinical findings
- Combination(s) of specified major and minor signs are sufficient for the diagnosis of AIDS

diseases.

However, this CDC/WHO definition requires extensive laboratory (culture and/or histology) capabilities to diagnose the specified diseases which would be accepted as indicative of the underlying immunodeficiency caused by HIV. Since most developing countries often lack adequate laboratory facilities, a WHO clinical definition of AIDS for adults in Africa was developed in 1985. This clinical definition with some adaptation is still used by many countries in Africa.

Field evaluation of this definition has shown that its specificity is high (i.e. about 90% of persons meeting this AIDS definition are also HIV positive).

## **Transmission of HIV Infection**

Epidemiologic studies in Europe, the Americas, Africa and Australia repeatedly and consistently have documented only three modes of HIV transmission:

1. Penetrative sexual intercourse (heterosexual) or homosexual.
2. Contact with blood, blood products, donated semen or body tissues/organs. The vast majority of contact with HIV infected blood involves transfusion of unscreened blood for the use of unsterilized syringes and needles.
3. Mother to child - in utero, and during or shortly after birth (perinatal transmission).

Although only three routes of HIV transmission have been documented, there exists ample public concern that there may be a "possibility" that other routes of transmission occur. These other routes of spread

which many persons have raised concerns about include :

- Water, air, coughing or sneezing.
- Daily and routine activities ("causal contact") such as sitting next to someone or shaking hands, working with people, or hugging.
- Swimming pools, public transportation, food, cups, glasses, plates, toilets, telephones, door handles.
- Insects or insect bites

None of these concerns are based on any scientific evidence. These concerns are similar to those voiced about the "possibility" that one might get syphilis or gonorrhoea from sitting on a public toilet seat.

Legitimate concerns about the severity of AIDS has been unfortunately transformed into unfounded concerns about the possibility of transmission of HIV by casual contact.

Are we concerned about the "possibility" of transmission of hepatitis B from sitting next to a carrier of this virus in an airplane? Are we concerned about eating in restaurants where 5 to 10% of the staff are hepatitis B carriers? Are we concerned about mosquito transmission from a hepatitis B carrier? Are we concerned about being in the same swimming pool as a hepatitis B carrier?

Admittedly, the severity of hepatitis B infection in general is much less than HIV infection, but when we recognize that some hepatitis B carriers are hundreds if not thousands of times more infectious

than HIV infected persons and there is no documentation that such transmission of hepatitis B occurs, then we need to appreciate how unfounded is the concern about the "possibility" of acquiring HIV infection via these routes.

Table 3 A and B describe HIV transmission rates following specific types of exposures.

These observations indicate that the relative dose of infectious virus is very important for transmission.

Transmission rates are extremely high for large doses such as would be expected in a unit of infected blood, and very low for a needle stick type accident.

Comparable studies of health care workers who sustain needle stick type exposure to a hepatitis B patient has shown transmission rates of over 20% per episode compared to the 0.5% for HIV.

Table 4 describes the transmission of HIV from man to man, man to woman and woman to man.

On a worldwide basis, the vast majority (probably more than 90%) of all HIV transmission is by penetrative anal or vaginal sexual intercourse. It has been amply documented that such transmission can be from an infected man to another man, from an infected man to a woman and from an infected woman to a man.

The only major question which remains to be answered is whether there is any significant difference in the efficiency of HIV transmission by an infected male compared to an infected female.

The available data suggests that, in general, an infected male is a more efficient transmitter of

Table 3(A). Transmission of HIV after exposure to an infected source.

Type of Exposure	Transmission Rate
1. BLOOD TRANSFUSIONS	Very high transmission rate (about 90%) documented
2. MOTHER - TO - INFANT	Transmission rates ranging from 0% to 70% have been reported
3. PENETRATIVE SEXUAL INTERCOURSE	Transmission rate per single contact estimated to be less than 1/1000 to 1/100; the presence of possible "cofactors" such as a concurrent infection with another sexually transmitted disease may greatly increase the transmission rate.

Table 3 (B). Transmission of HIV after exposure to an infected source.

Type of Exposure	Transmission Rate
4. IV DRUG ABUSE	About 1% from any single exposure if there is much blood in the shared needle/syringe
5. HEALTH CARE PROVIDERS	Less than 1% of needle-stick type exposures have resulted in laboratory documented infection
6. HOUSEHOLD	Transmission rate extremely low or non-existent with non-sexual exposures (i.e.) sharing of bedding, toothbrushes, eating utensils, etc.
7. OTHER	Transmission risk from usual school, social, community and employment type contact is considered to be non-existent.

Table 4. Sexual transmission of HIV

MALE-TO-MALE	Primarily by receptive anal intercourse, when mucous membrane of the rectum is exposed to HIV* from deposited semen
MALE-TO-FEMALE	Primarily by receptive vaginal intercourse when mucous membrane of the vagina and cervix is exposed to HIV* from deposited semen
FEMALE-TO-MALE	Primarily by exposure of urethral mucosa or by micro-lesions on the glans or foreskin of the penis to vaginal secretions which contain HIV*

\* The exact role(s) of lymphocyte bound HIV or cell free HIV in transmission of infection has not been determined

HIV than an infected female.

However, regardless of possible differences in the efficiency of transmission from any single act from an infected female to a male, such a difference can be easily obscured by the commulative risk of repeated exposure over many months or years to an infected partner. Cofactors such as genital ulcers may also increase the efficiency of HIV transmission.

Various types of epidemiological case/control and cohort studies (i.e. studies which involve the collection of personal history and laboratory results from a group of persons) have shown that the relative risk of sexual transmission of HIV varies significantly depending on the type of sexual contact involved.

Table 5 lists from high to low or negligible the risk of HIV transmission by type of sexual contact.

The highest risk is taken by the receptive partner (male or female) in anal intercourse and the next highest risk is the receptive female partner in vaginal intercourse.

"Wet" kissing (deep or vigorous tongue kissing) likely carries some risk, but this has not yet been measurable.

It should be noted that the use of condoms reduces the risk of HIV transmission, but does not eliminate such a risk.

As a result of ignorance or a limited understanding of the epidemiology and transmission of HIV infections, there have been extreme misconceptions about the AIDS pandemic, such as

"Only homosexuals and intravenous drug abusers

will be affected".

"Within several decades, everyman, woman and child on earth will be infected and doomed to death".

Table 5. Gradient from high to low risk of HIV transmission by sexual contact.

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High	Receptive anal intercourse
	Receptive vaginal intercourse
	Insertive vaginal intercourse
	Insertive anal intercourse
	Oral contact (penile, vaginal, anal)
	Any type of sexual intercourse with correct use of a condom
Low/ none	"Wet" kissing (deep or tongue kissing)

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Based on all the available epidemiologic, laboratory and clinical studies on AIDS the following is WHO's perspective on the AIDS pandemic:

AIDS will be one of the most, if not the most, severe human disease ever documented.

Persons with behaviours which place them at risk of HIV infection:

- having unprotected sexual intercourse with multiple partners
- sharing injection equipment with others without sterilization will continue to be

the populations at risk of AIDS.

Persons without such risk behaviours are not at any measurable risk of AIDS.

The risk of AIDS from transfusion of HIV infected blood or from the use of unsterile skin piercing instruments is being aggressively addressed globally and such risk can be virtually eliminated by current programmes with available technology.

### Laboratory Tests for HIV Infections

With the isolation and identification in 1983 of the etiologic virus for AIDS, there has been rapid advances in the development of laboratory tests to detect HIV infections. Table 6 shows the basic category or type of tests available as of late 1987 for the diagnosis or detection of HIV infections.

HIV antibody tests first became available for general use in 1985 and since then about 100 million or more, tests have been done worldwide. The majority of these have been for the screening of donated blood, but an increasing number of such tests are being used to measure and monitor the prevalence of HIV infection in population groups and to confirm the clinical diagnosis of ARC or AIDS cases.

Antigen tests have, as of late 1987, become available, but appear to be positive primarily when an infected person is viremic; early after infection and then after clinical symptoms appear. In addition, the sensitivity of this test in detecting viremia during these periods have not been well established.

Virus culture has basically been restricted to research studies because of their costs and limited

Table 6. Laboratory tests for detection of HIV infection.

<b>Antibody tests</b>	Widely used for screening donated blood and to support clinical diagnosis. Exceptionally accurate tests, but because of the possibility of false positive results, additional supplemental antibody testing is usually indicated.
<b>Antigen tests</b>	Recently available. The sensitivity of such tests have not been well established.
<b>Virus culture</b>	Definitive evidence of infection. There is limited availability of such testing because it is time-consuming, expensive, and technically demanding.

availability.

Table 7 describes the HIV antibody tests which are available or in their final developmental stages as of late 1987.

The accuracy of these tests are as good, if not better than other biologic tests in common usage. Nevertheless, because of the severe stigma and grave medical implications attached to a positive test result, additional supplemental tests (sometimes referred to as "confirmatory" tests) are usually indicated to reduce the number of false positive results to as few as possible.

ELISA or EIA tests will likely continue to be the predominant HIV antibody screening test used worldwide, but some of the new antibody tests are being developed for use in areas where laboratory facilities are limited. The newer tests are being designed to be simple, rapid and inexpensive.

### **The Accuracy of HIV Antibody Tests**

The following and similar statements about the accuracy of HIV antibody tests are frequently voiced and they result from a basic lack of understanding of the elementary statistics involved in applying these tests to screen populations.

"HIV antibody tests are not accurate - they are associated with a very high proportion of false positives".

Table 8 - 12 describes the accuracy of these (i.e. their sensitivity and specificity) and outlines with a couple of examples how the predictive value of these tests vary markedly depending on the

Table 7. HIV antibody tests.

**Antibody Tests Routinely Used for Screening**

Enzyme-linked immunosorbent assays (ELISA or EIA)

- first generation tests - uses partially purified viral lysates
- Second generation tests - uses synthetic peptides or recombinant proteins

**Supplemental antibody tests routinely used**

- Western blot assay - detects antibodies to electrophoretically separated viral proteins
- Immunofluorescence assay (IFA)

**New antibody tests which have recently become available or are in their final development stages**

- Agglutination assays (gelation, latex, turkey RBCs)
- Dot immunobinding assays

percentage of infected persons in the population tested.

In the last example (Table 12), where the predictive value is less than 10%, the use of additional supplemental tests such as Western blot or IFA will markedly reduce the numbers of false positive results, but will not completely eliminate all false positives because these supplemental tests themselves are not 100% specific.

## HIV Screening Programmes

In addition to technical concerns about the accuracy of HIV antibody tests, the use of these tests to screen populations raises many complex social and ethical issues.

HIV screening programmes may be useful, but they have to be carefully considered and designed.

If such programmes are considered, their rationale need to be clearly defined and all of the associated logistic, technical, economic, legal, ethical and social issues should be addressed and resolved before implementation.

Inadequately designed HIV screening programmes may be unnecessarily intrusive, expensive, ineffective and may threaten fundamental human rights. In addition, such programmes will likely divert scarce resources from more effective educational programmes and other HIV prevention activities.

Table 8. Definitions of sensitivity and specificity.

<b>Sensitivity</b>	The accuracy of a test in identifying an infected person. A test with low sensitivity will have many "false negatives"
<b>Specificity</b>	The accuracy of a test in identifying a non infected person. A test with low specificity will have many "false positives"

Table 9. The distinction between Sensitivity/Specificity of a test and the Predictive Value of a test

- The sensitivity and specificity of a test are inherent properties of the test and will not vary significantly unless there are laboratory errors.
- The predictive value of a positive test is the likelihood that a positive test will identify an infected person rather than a false positive test result
- The predictive value of a positive test will vary markedly depending on how many infected persons are present in the population tested (i.e. the prevalence of infection)

Table 10. How the Predictive Value varies according to the prevalence of infection

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- The predictive value of a positive test in a population with no infection will be zero, i.e. all of the positives will be false positives.
  - The predictive value of a positive test in a population with a very low infection rate (such as blood donors in Western Europe) will be very low.
  - The predictive value of a positive test in a population with a high infection rate will be very high.
-

Table 11. The Predictive Value of a positive test in a population with a high prevalence of infection

Assumptions	
- The infection rate is 1 per 10 (10%)	- Test Sensitivity is 99.9%
- 100,000 persons are tested	- Test specificity is 99.9%
(i.e. 10,000 persons are infected)	
- Since the test is 99.9% accurate in identifying infected persons (sensitivity, it will likely correctly detect 9,990 of the 10,000 infected persons.	
- Since the test is <u>only</u> 99.9% accurate in identifying non-infected persons (specificity), it will likely falsely identify 90 of the 99,000 non-infected persons as infected.	
- Thus, there would be 10,080 positive tests and the predictive value of a positive test in correctly identifying an infected person in this situation is $9,900/10,080 =$ more than 98%	

Table 12. The Predictive Value of a positive test in a population with a low prevalence of infection

Assumptions	
- The infection rate is 1 per 10,000	- Test Sensitivity is 99.9%
- 100,000 persons are tested	- Test specificity is 99.9%
- Since the test is 99.9% accurate in identifying infected persons (sensitivity), it likely will correctly detect all of the 10 infected persons.	
- Since the test is only 99.9% accurate in identifying non-infected persons (specificity), it will likely falsely identify about 100 of the 99,990 non-infected persons as infected.	
- Thus, there would be 110 positive tests and the predictive value of a positive test in correctly identifying an infected person in this situation is $10/110 = \text{about } 9\%$	

## **Monitoring HIV Seroprevalence in Sentinel Populations**

Healthy population groups which can be conveniently tested for HIV antibody and whose members are likely to be reasonably representative of the sexually active population with respect to HIV prevalence include: prenatal clinic attendees, voluntary or "non paid" blood donors, health care workers without routine or extensive exposure to blood, non health care workplace - based groups and persons accompanying patients to outpatient or clinic facilities.

Population groups which are at increased risk of exposure to HIV include: sexually transmitted diseases (STD) clinic attendees, female prostitutes/bar girls or "femmes libres", male homosexuals/bisexuals, IV drug abusers, persons who have received multiple blood transfusions or blood products, military personnel and frequent travellers such as seamen and truck drivers.

Testing of several hundred blood samples for each of the above groups can provide valuable information on the pattern and distribution of HIV infection, and suggest the predominate mode of spread of HIV in a given area. As many as possible of the above groups should be tested as part of the initial assessment of the epidemiology of HIV in an area. However, the presence of and the relative accessibility to, many of the groups at "increased" risk will vary greatly from area to area.

## **Global Surveillance of HIV Infection and AIDS**

As of late November, 1987, over 65,000 AIDS cases were reported to the World Health Organization

**AIDS Cases Reported to WHO by Region by year**

Continent	1979	1980	1981	1982	1983	1984	1985	1986	1987*
Africa	0	0	0	3	14	82	185	3,111	5,000
Americas	14	55	273	1,054	3,172	6,211	11,015	16,052	18,000
Asia	0	1	0	1	8	4	29	54	150
Europe	0	3	13	69	215	573	1,341	2,476	4,800
Oceania	0	0	0	1	6	45	124	239	400

\*1987 totals projected with data as of October 1987

from close to 125 countries around the world. However, reluctance to report cases from some areas, combined with under-recognition of AIDS and under-reporting to national health authorities, means that the number of reported AIDS cases is only fraction of total cases to date. The present world total may be closer to 150,000.

Based on a combination of reported cases of AIDS and on numerous sero surveys, a reasonable picture of the current global pattern of HIV infection and AIDS can be obtained.

Three distinct epidemiological patterns of HIV infection and AIDS in the world can be distinguished. The explanation for the existence of these patterns include the apparent date of HIV entry into the population, the relative importance of the three modes of HIV transmission, and details of sexual and other social risk behaviours in the population.

The first pattern involves areas most likely first infected during the late 1970s and early 1980s and in which homosexual man and intravenous drug users are most affected. This pattern includes the United States, Canada, Western Europe, Australia, New Zealand and parts of Latin America. In these areas, spread of HIV beyond the risk groups mentioned is occurring, but the dominant burden of infection and disease remains and is expected to remain among male homosexuals and IV drug users.

The second pattern involves areas most likely first extensively infected by the mid of late 1970s and in which heterosexual transmission is dominant. The large number of infected women is, sadly, translated into a large number of perinatally infected infants. As a result of resource constraints, HIV transmission is still occurring through HIV-contaminated blood

transfusions and re-use of unsterile needles, syringes and other skin-piercing instruments both within and outside the health care system. This pattern has been observed primarily in Central Africa and in some areas in the Caribbean.

The third pattern involves areas where introduction of HIV likely only began in the early to mid 1980s. The numbers of infected persons is now small and rates of infection in persons practising very high behaviours such as male or female prostitutes are in general as low as infection rates among blood donors in the United States or Europe. Examples of this pattern include Asia, the Pacific Region, the Middle East and Eastern Europe.

## **Global Impacts and Responses to AIDS**

Following the HIV and AIDS pandemics is a wave of economic, social and political issues and response to the first two epidemics.

The economic impact of HIV and AIDS is only beginning to be appreciated. In the United States, the direct medical care costs alone for treatment of AIDS patients in 1991 are estimated at 8 to 16 billion dollars. In developing countries, the medical costs of AIDS have not yet been measured, but the displacement effect, as AIDS patients consume limited supplies of drugs, require diagnostic tests and occupy limited numbers of hospital beds, must be considerable.

The impact of AIDS and HIV infection on social and economic development may be critical. For example, mortality rates among the economically and socially most productive age groups, especially 20-45 years olds, may rise several-fold as a result

of AIDS. This selective impact on young and middle-age adults, including business and government workers and members of social, economic and political elites, leads to a potential for economic and even political destabilization. In addition, in areas where 10 percent or more of pregnant women are HIV-infected, AIDS related infant mortality may become greater than the total infant mortality rate, from all causes, in industrialized countries. Thus, the projected gains in infant and child health anticipated through the Child Survival initiatives may be cancelled by HIV.

Fear and ignorance continues to fuel debates about AIDS which have readily and widely acquired a political dimension. All too often, AIDS have unveiled thinly disguised prejudices about race, religion, social class, sexual orientation and nationality. As a result of unfounded fears, AIDS threatens free travel between countries and open international exchange and communications.

A global view of AIDS is not complete without considering, even briefly, the global response to AIDS. At local and national levels, there have been some extraordinary examples set in response to AIDS - some very good, some not so good. Although delayed some African countries have now established very effective national AIDS committees and national plans against AIDS. In contrast, most developed countries have yet to develop comprehensive national plans to respond to AIDS.

At the international level, with the same energy and commitment with which WHO eradicated smallpox, WHO is not committed to the more urgent, complex and difficult task of global AIDS control. Looking over the global situation, WHO believes the spread of HIV can be stopped, even through

effective drugs or a vaccine are not yet available. To do so, however, will require a sustained, long-term commitment that of necessity, goes beyond the boundaries of any one country. If AIDS is to be controlled, education coupled with the means to eliminate or modify risk factors and risk behaviours will be the key. In addition, how understanding and caring, we as a society can be towards HIV infected persons will be critical for the effective management of this pandemic problem. Finally, the global control of AIDS will require both committed national AIDS programmes and strong international coordination, cooperation and leadership.



## HEALTH EDUCATION AND AIDS

Frape

World Health Organisation

### Summary of Lecture Delivered by Mr. Frape

COMMUNICATION foundation is an important step in the successful implementation of health education programme. There have been instances of failure of health education because of lack of communication. Good intention alone does not work. The communication shuould be clear, understandable and relevant so as to generate maximum resonance with the inner feelings. The health education is to be geographically specific depending on the rituals and social life. The target people for health education need to be identified like prostitutes, students, medical professionals etc., and the nature of the message needs to be separate for each group failing which the message would be complicated and irrelevant for some of the groups. Poster materials for display in places like drinking bars, etc., messages through televisions, small presentation in the form of soap opera are the various other effective means of health education.

Mr. Frape also displayed a variety of health education materials which were specifically useful for a community in South East Asia where the literacy rate is not very high. Some of the messages which have been found to be effective are :

"Spread the word, not the disease", "A one night stand with AIDS patient may be your

"last" etc. Some messages have impact on a particular group e.g. "AIDS can kill two people at once" for the pregnant women. Sometimes the message needs to be designed keeping in mind the social rituals and practices, e.g. "Don't shame, be game" has been found to be more suitable in places where use of condom has been labelled as shameful practice. At times the colours picked up for the display of messages in posters have been the ones linked with the social life of the people of that particular region. At times putting across the message as "AIDS is a killer, you can't cure AIDS, you can avoid" in a better substitute for the message "prevention".

However, Mr. Frape admitted about the limitation of preventing prostitutes from prostitution. For a prostitute found to be positive for AIDS infection, some legal measure could be adopted and they should be provided an alternative profession, he added. He stressed the need of removal of myths like 'we get AIDS from foreigners only and there is a genetic resistance for the Asians' till it is proved to be so.

## AIDS IN RELATION TO BLOOD AND BLOOD PRODUCTS

B.B. Gaitonde  
SEARO, WHO, New Delhi

THERE are three basic components for the cycle of transmission of HIV infection through blood i.e. availability of susceptible population, presence of virus in the blood and stability of the virus in the blood.

The main success towards prevention of HIV infection through blood or blood products depends on three factors viz. selection of donors, ensuring the blood products being free from infection and usage of known healthy donors blood. History taking, clinical examination, antibody testing for HIV, evidence of other sexually transmitted diseases like syphilis etc. form important components for selection of donors. In future, easy and convenient method for the detection of viral antigen would also help to a great extent in this regard. Exclusion of plasma pools showing positive evidence of HIV infection and adaptation of means for inactivating virus, physical or chemical, during processing ensures freedom of blood products from risk. In the absence of above measures, use of known safe, relation or voluntary donor's blood provides reasonable amount of safety.

Out of the different components of blood, albumin, intravenous gamma globulins (IVIG) and Hepatitis B Vaccine are considered to be safe by virtue of their preparation procedure while factor VIII and IX (specially prepared from a large pool) is considered to be unsafe. The methodology for

ensuring safety of blood includes ELISA test for HIV antibody which is highly sensitive although it is not free from false positive results. Apart from this, use of disposable syringes, needles, IV sets and health education and legislation are the important measures for preventing transfusion associated AIDS.

On the basis of available data from USA, the incidence of transfusion associated AIDS has been reported to be as high as 66.6% among persons above 49 years of age and that associated with clotting factor upto 65.6% in the age group between 20 and 49 years. The incidence of transfusion associated AIDS among the total AIDS cases has been found to increase from 1.4% to 1.9% in adults and from 14.5% to 17.4% in children with an overall increase from 1.7% to 2.1%, between 1983 to 1985. Less information is however available from developing countries but several studies suggest that as many as 10% of total cases of HIV infections among adults may be associated with blood transfusion in some areas.

Long before the direct evidence for the virus in transfusion blood was available, a number of epidemiological facts pointed out the possibility of transfusion associated AIDS. Reports on homosexuals, IV drug users, haemophiliacs demonstrated that there are relatively more reported incidence of AIDS in haemophiliacs and in children receiving blood/blood products. It was also clearly demonstrated that the transmission pattern is similar to Hepatitis. The direct evidence, however, came up later on from the successful isolation of HIV from the blood lymphocytes of transfused patients.

Some of the important issues which a developing country faces regarding transfusion associated AIDS include determination of the magnitude of the

problem by conducting routine screening of high risk groups, ready availability of screening and confirmatory tests, evaluation of cost involved in such measures thereby deciding whether or not AIDS screening could be given a priority as compared to other health problems. The social implications of an individual declared positive for HIV antibody need also to be kept in mind.

It is realised that the blood transfusion services in SEAR countries is not upto the mark from safety point of view. WHO recommended technologies for ensuring safety are also not routinely followed thus rendering the quality of blood questionable. Routine physical examination of donor is rarely practised. There is also a significant wastage of blood because of inappropriate use. Inadequate indigenous production of blood products in turn contributes to ineffective quality control. Some important landmarks of the meetings held by WHO on safety of blood and blood products and recommendation of WHO, are as follows:

### 1. AIDS meeting 1983

Recommendations :

- Education
- Exclusion of high risk group donors
- Ensuring safety of blood/products.

### 2. Second AIDS meeting 1985

Recommendations:

- Donors screening for antibody wherever feasible.
- Inactivation of virus in blood/blood product.

### 3. Expert Group Meeting 1985

- Comprehensive recommendations on

safety of blood/blood products.

4. Regional Meeting on AIDS - 1986 and 1987  
Recommendation on regional work plans for prevention and control of AIDS.
5. WHO SEAR Consultative meeting recommendations (1987)
  - Assess the prevalence of AIDS/HIV infection.
  - Education and information
  - No need for mandatory testing of blood in view of very low prevalence of HIV infection
  - All blood products to be certified as free from HIV infection
  - Laboratory facilities to be strengthened

## NATIONAL AIDS CONTROL PROGRAMME

**K.K. Dutta**

Directorate General of Health Services, New Delhi.

I am extremely happy to be with you to review the surveillance activities undertaken during the last 17 months. You will re-call that the surveillance for AIDS started with establishment of 2 surveillance centres, one at National Institute of Virology, Pune and another at Christian Medical College, Vellore. After the detection of AIDS infection for the first time in the country in the month of April, 1986, the surveillance activities were expanded and as on date we have 36 surveillance centres covering the entire country. We have been able to establish the surveillance centres in important town and state capitals and in future we wish to extend the surveillance network further so that services could be further decentralised.

Upto the end of 15th November, 1987 as many as 62,574 persons amongst the high risk group have been screened in India of which 167 have been confirmed to have AIDS infection. Of these 167, fifteen were cases of full-blown AIDS and the remaining were asymptomatic carriers.

The surveillance machinery has not been functioning uniformly everywhere. Some of the surveillance centres have screened only couple of hundreds while other surveillance centres have screened around 8 to 9 thousand. Possibly the reasons are:

- (i) inadequate support from the state AIDS cell.

- (ii) inadequate contingency support from ICMR
- (iii) lack of adequate personnel in the surveillance centres.

Efforts have been made to establish state AIDS cells in all the states but as the AIDS control scheme has not been cleared by the Government of India, none of the states have yet established state AIDS cells as a separate functional entity. It is expected that AIDS control scheme will be cleared shortly and once it is cleared the state AIDS cell is likely to be functional to assist surveillance centres in the surveillance activities.

Surveillance centres have been established in places where basic expertise and facilities for virologic work is available but no separate staff have been provided yet as exact quantum of work of each surveillance centre has not been worked-out. It is suggested that you may make an exercise in this regard and indicate the immediate staffing pattern that each surveillance centre in states should have keeping in view the expected quantum of work to be carried out as per the national AIDS control programme.

In addition, each surveillance centre should work out the population it could cover and work out estimated population at risk. A target oriented schedule of surveillance activities indicating total number to be screened on a sample basis so that atleast after a lapse of 6 months each surveillance centre can furnish to the nation the pattern of AIDS infection in his area of jurisdiction so that the same could be projected and the entire pattern of the AIDS infection in the country could be elucidated.

All the surveillance centres have been provided with

diagnostic equipments and kits. Diagnostic equipments are very costly and proper maintenance need to be made so that these equipments should remain functional for a longer period. For undertaking the maintenance work, local expertise may not be available. In that case a scheme of maintenance for all the surveillance centres regarding diagnostic equipments could be worked out so that the same could be referred to appropriate levels.

ELISA test kits are costly and have got a short shelf life; therefore programme of screening should be well tailored to optimise its use and every effort should be made so that no wastage results.

Surveillance centres should participate in the training programme. It is suggested that a co-ordinated training programme is worked out indicating the funds required so that the same could be examined further and arrangements are made for provision of funds.

Reporting from the surveillance centres are erratic. Some centres are sending regularly. While some centres are lagging behind. As the reports are to be sent to the Prime-minister's Secretariat fortnightly, it is again emphasised that all the surveillance centres should make the reports available in time. However, it is stated that the present proforma may be examined and if there is a need to change the same, attempts could be made to work-out a new proforma.

At the end, I would like to stress that National AIDS Control Scheme will succeed only if the surveillance activities are undertaken with dedication and earnestness. Health Education plays a pivotal role in AIDS control, therefore apart from surveillance each surveillance centre may contribute

in preparing health education materials for the State Health Authorities.

## LABORATORY SURVEILLANCE OF AIDS IN INDIA

S.P. Tripathy & Prema Ramachandran

Indian Council of Medical Research, New Delhi.

HIV infection is a recent addition to viral diseases. The first cases of Acquired Immuno Deficiency Syndrome (AIDS) were reported in 1981. The causative agent of human immuno deficiency virus (HIV) was isolated in 1983 and its association with AIDS was established in 1984. The early case were reported mainly from USA and Central African Countries. However, during the last two years presence of HIV infection has been reported from many countries in Europe, Australia and Asia.

Indian Council of Medical Research constituted a task force in 1985 to consider steps to be taken for investigations of HIV infection in India. The task force recommended:

- a) Establishment of a network of Centres for clinical and serological surveillance of HIV infection.
- b) Development of essential infrastructure and trained manpower to carry out :
  - 1) Clinical and sero-surveillance for HIV infection
  - 2) Investigation, follow-up, care, treatment and counselling of sero-positive individuals
  - 3) Epidemiological, Virology and Immunological studies in HIV infection

- 4) Clinical trials on viricidal, immune-stimulatory and other drugs for treatment of HIV infection.
- c) To help in development of appropriate Health Education material on prevention of AIDS.
- d) Help in evolution and implementation of National AIDS control strategy.

Sero-surveillance for HIV infection is the collaborative effort of Government of India, Indian Council of Medical Research and State Health Authorities. Government of India has taken steps to obtain essential equipments and purchase ELISA and Western Blot Kits for sero-surveillance. Indian Council of Medical Research has taken up the responsibility of providing a contingency grant to the Centres, supply ELISA kits and Western Blot kits to surveillance centres, monitoring their activities, looking-after quality control and compilation of fortnightly sero-surveillance reports. The State Health authorities have established State AIDS Cells for organising samples collection from high risk group and provided infrastructure for establishment of surveillance centres for serological screening of HIV antibody.

Sero-surveillance for HIV infection was started in 1985.

The sero-surveillance programme aims at:

1. Serological surveillance of patients who have symptoms suggestive of AIDS disease or AIDS related complex.
2. Serological surveillance in apparently healthy members of the community belonging to

high risk groups such as homo, hetero or bi-sexually, promiscuous persons, intravenous drug addicts, high risk blood donors and blood/blood product recipients.

ICMR has helped in establishment of four reference laboratories at National Institute of Virology, Pune, Christian Medical College, Vellore, All India Institute of Medical Sciences, New Delhi and National Institute of Communicable Diseases, Delhi.

Reference Centres have taken up the following responsibilities :

- a) Training of persons from surveillance Centres in carrying out ELISA tests for HIV antibodies
- b) Quality control of sero-surveillance activities of surveillance Centres
- c) Confirmation of ELISA positive sera by Western Blot test
- d) Investigation of immune profile in virus infection
- e) Virus isolation and characterisation

A network of surveillance Centres have started sera collection from high risk group and are undertaking ELISA tests for HIV antibodies. Personnel from 41 Centres have been trained in ELISA techniques.

Until 15th October 1987, 56934 persons in India from high risk group have been screened for HIV antibodies. 145 persons have been confirmed to have HIV antibodies both by ELISA and by Western Blot

test (Table 1). So far 13 persons have been reported to have AIDS disease. All of them have succumbed to the infection. 2 women have been reported to have symptoms of AIDS related complex. Both are under observation. Rest of the sero-positive individuals are asymptomatic and are being followed-up. Follow-up of asymptomatic sero positive individuals over the next few years would provide information on the course of HIV infection in these individuals, the type of health problems they face and the response to various therapeutic measures.

The first evidence of presence of HIV infection in India was obtained in March 1986 when the sera from six female prostitutes in a vigilance home in Madras were found to have HIV antibodies are present in very small proportion (sero positivity rate of three per thousand) of high risk persons screened. Majority of these individuals are from Tamil Nadu. They belong not only to the port city of Madras and neighbourhood but also to the interior districts like Madurai and Tiruchi. Sero positive individuals have been detected from other States like Andhra Pradesh, Maharashtra, Gujarat, West Bengal, and Jammu Kashmir. Continued sero surveillance in different regions of the country over the next few years will provide information not only regarding prevalence of HIV infection in different regions of India, in different high risk groups, but also changes if any in sero positivity rate over time.

Majority of sero-positive individuals are prostitutes. None of the prostitutes have developed AIDS disease, one had symptoms of ARC but is currently asymptomatic. Since heterosexual promiscuity appears to play roll in transmission of HIV infection in India, surveillance in prostitutes and STD clinic attending population has been strengthened and intensified. This however, is a rather difficult endeavour not

only because of the multiplicity of sexual partners, the long incubation period and asymptomatic nature of the infection.

Three of the sero-positive persons appear to have developed the infection after blood or blood product infusion abroad. All these received infusion prior to 1984 when screening tests for HIV antibodies became available and screening of blood donors was made mandatory in USA. Indian Government has made HIV screening mandatory for all imported blood products so that the risk of transfusion borne HIV infection is minimised.

In India it is estimated that about a million bottles of blood are collected and used every year. ICMR advisory group on transfusion transmitted diseases had recommended that as a preliminary step all blood donors who are found to be VDRL or HBsAg positive should be screened for HIV antibody. So far, over 4,000 blood donors have screened and none were found to be having antibody against HIV. The screening of high risk blood donors is continuing and in due course of time will provide data on prevalence if any, of HIV infection among risk blood donors in different regions of India. Based on this information, appropriate intervention measures to minimise the risk of transmission of HIV through blood transfusion could be initiated.

A large number of foreign students come to India for higher education. In some of the countries from which these students come, the prevalence of HIV infection even among general population is quite high. A programme for health check-up of all foreign students in India including screening test for HIV infection has been initiated in November 1986. So far over 6661 students have been screened and 23 of them have been found to have HIV antibodies

Table 1. Sero-Surveillance for HIV Infection Period of Reporting:  
From inception to 15th October 1987.

<u>C E N T R E</u>	<u>N U M B E R</u>	<u>Screened</u>	<u>ELISA positive</u>	<u>Western Blot positive</u>
AIIMS, New Delhi	2691	15*	13*	
NICD, Delhi	6971	10*	8*	
NIV, Pune	5596	36*	32*	
CMC, Vellore	6591	136*	92*	
IMS, Srinagar	751	1	1	
MC, Rohtak	3381		1	
PGI, Chandigarh	2244	2	2	
MAMC, New Delhi	2220	0	0	
CJIL, Agra	510	0	0	
KGMC, Lucknow	375	0	0	
RMRI, Patna	476	0	0	
RMC, Imphal	813	0	0	
STM, Calcutta	540	0	0	
NICED, Calcutta	1145	1	1	
RMRC, Jabalpur	1626	10	10	
GMC, Bhopal	578	2	0	

Contd.... /

BJMC, Ahmedabad	1333	1	
IHH, Bombay	776	2	
GMC, Bombay	2096	2	
SVMC, Tirupati	273	0	
RMRC, Bhubaneswar	108	0	
AMC, Visakhapatnam	84	0	
OMC, Hyderabad	291	1	
GMC, Goa	601	0	
BMC, Bangalore	351	0	
MC, Trivandrum	761	5	
JIPMER, Pondicherry	1783	16	
MMC, Madras	7605	37	
Apollo Hospital, Madras	1500	0	
CH & RC, Indore	562	0	
GMC, Nagpur	860	3	
MMC, Madurai	1800	17	
IOP, Delhi	180	0	
IPM, Hyderabad	225	0	
I.C.H. Madras	1255	11	
Total	56934	197	145

\* includes all sera sent to reference centres for confirmatory Western Blot test.

Table 2 : Sero-Surveillance of HIV Infection Trends in Sero Positivity Rates in High Risk Groups (Rate/1000)

	APRIL 1986	AUGUST 1986	DEC. 1986	OCT. 1987
INDIANS	No	Rate	No	Rate
HETEROSEXUALLY PROMISCUOUS				
MEN	1072	-	4096	0.2
WOMEN	306	-	3.2	7.1
0.9				
CORRECTIVE INSTITUTION INMATES				
MEN	204	-	379	-
WOMEN	104	96.2	755	27.8
HOMOSEXUALS	-	-	90	-
BLOOD DONORS	872	-	3056	-
BLOOD/BLOOD PRODUCT RECIPIENTS	34	-	211	-
SUSPECTED CASE OF ARC/AIDS	-	-	15	200
FOREIGN STUDENTS	-	-	-	-
OTHER FOREIGNERS	-	-	-	-
T O T A L	3027	3.3	10398	2.8
			26796	2.6
			56934	2.5

by ELISA and Western Blot test. All the 23 are currently healthy and asymptomatic (Table 2).

Studies on immune status in HIV infected individuals are being carried out at All India Institute of Medical Sciences, New Delhi. All the four persons reported to be suffering from AIDS disease had severe immuno depression. These individuals are being followed up.



P R E S E N T A T I O N   O F  
R E P O R T S



## PRESENTATION OF REPORTS BY AIDS SURVEILLANCE CENTRES

### 6.1 AGRA

**Lalita Shivraj**  
Central JALMA Institute, Agra.

A total of 426 sera were screened for anti-HIV IgG antibodies by inhibition ELISA (Wellcozyme)

Normal Healthy persons	- 16
Leprosy patients	- 348
Healthy contacts of patients	- 29
Tuberculosis patients	- 33

All these sera were negative for anti HIV by ELISA.  
All the 426 sera were tested for HBsAg by IHA (Cellongnost).

Table 1. Results of IHA (Cellognost) for HBsAg.

Group	Number studied	Positive No(%)	Negative No(%)
1. Normal Healthy persons	16	Nil	16(100)
2. Leprosy patients	348	53(15)	295(85)
3. Healthy contacts of Leprosy patients	29	4(14)	25(86)
4. Tuberculosis patients	33	14(42)	19(58)
Total	426	71(17)	355(83)

**Western Blot analysis** was performed on 69 randomly chosen sera from among the 426 tested by ELISA (Table 2,3,4).

Table 2. The frequency of HIV bands by WB in the three groups.

HIV Antigen	Leprosy patients n = 43	Healthy contacts of Leprosy patients n = 5	TB Patients n = 21	Total No.(%)
p55	22	3	6	31(45)
p24	14	2	1	17(25)
p66	5	2	Nil	7(10)
p66	5	1	Nil	6(9)
p17	3	Nil	1	4(6)
gp41	1	Nil	Nil	1(1)
p51	Nil	1	Nil	1(1)

Table 3. WB reaction to specific HIV antigen.

HIV Antigens	Leprosy patients n = 43	Contacts of Leprosy patients n = 5	TB Patients n = 21
p24 Alone	5	Nil	1
p24+p55	2	Nil	Nil
p24+p17	1	Nil	Nil
p24+above p66	1	1	1
p24+p55+p17	1	Nil	Nil
p24+p56+p66	2	Nil	Nil
p24+p55+above p66	1	1	1
p24+gp41+p55+above p66	1	Nil	Nil
	14	2	1

Table 4. WB reactions to other HV antigen.

HIV Antigens	Leprosy patients n = 43	Contacts of Leprosy patients n = 5	TB patients n = 2
p55 alone	14	1	5
p55+p66	1	Nil	Nil
p55+p17	Nil	Nil	1
p55+p51+p66	Nil	1	Nil
p66 alone	1	Nil	Nil
p66+above p66	1	Nil	Nil
Above p66 alone	1	Nil	Nil
p17 alone	1	Nil	Nil
Total	19	2	6

Of the 69 sera tested by WB assay, 33 out of 43 leprosy patients, 4 out of 5 healthy leprosy contacts and 7 out of 21 tuberculosis patients showed reaction to one, two or multiple HIV antigens and 17/69 subjects showed reaction to the specific p24 antigen.

VDRL test was carried out on the 69 sera tested by WB assay. Results showed no correlation between VDRL positivity and HIV bands. Similarly, no correlation was observed between the HIV bands and HBsAg in these 69 subjects.

### **Collaborative study**

A study has been initiated in collaboration with Dr. Dhir of S.N. Medical College to screen the risk groups for anti HIV antibodies. So far 84 samples have been screened by ELISA and found to be negative.

### **6.2**

#### **AHMEDABAD**

**V.V. Kollali**

B.J. Medical College, Ahmedabad.

- A) A total of 1333 samples were processed between September, 1986 to September, 1987.
- B) Number of samples found positive - ONE
- C) Age group and sex for all samples screened:

Age	Male	Female	Total
20 & below	74	62	136
21 - 30	518	276	794

31 - 40	194	101	295
41 & above	80	23	103
Not-known	5	-	5

### Category screened

	Males	Females	Total
1. S.T.D. Clinics Includes homosexuals, heterosexuals)	407	311	718
2. HBsAg positive	150	68	218
3. Prisoners	84	-	84
4. Professional blood donors	53	2	55
5. Recipients of blood/ blood products (cases of multiple transfusions i.e.thalassaemia)	25	18	43
6. Persons on dialysis (Kidney diseases incl- uding transplantation	29	15	44
7. Mental hospital	6	5	11
8. Persons with symptoms of ARC/AIDS (one was positive by ELISA & WB test	2	-	2
9. Medical fitness (S.P.H etc. they are routinely screened for VDRL)	51	7	58
10. Relatives of the patient (wife child etc.)	5	3	8
11. Foreigners	83	9	92

**Case of AIDS** Positive both by ELISA and Western Blot. Patient 41 yrs. Male, frequent visitor to Africa on business trips was diagnosed as AIDS at Nsambya Hospital, Campala (Uganda). He was shifted to

Ahmedabad with low grade fever, bitemporal headache, loss of weight 10 kg. within last 2 months.

## 6.3

### BHOPAL

**B.S. Darbari & Q. Khan**  
Gandhi Medical College, Bhopal

A total of 926 sera have been screened by ELISA till September 1987. The various categories of people screened include both Indian and Foreigners. Among the Indians, the populations screened are :

**Prostitutes.** A total of 92 prostitutes from Bhopal and nearby places.

**Jail Inmates.** 63 males and 16 females from Central Jail, Bhopal. A few of the males had homosexual contacts.

**Bisexuals.** Eight bisexual males (apart from the jail inmates) living in Bhopal.

**Blood Donors.** Blood donors (51 males & 9 females) with either a positive V.D.R.L. test or a positive RPHA test for Australia Antigen.

**Blood or Blood product recipients.** one female with a history of blood transfusion and complaints of loss of appetite, weakness and vomitting.

**From STD Clinic.** 64 males and 1 female attending STD clinic and giving history of multiple sexual contacts.

Others. one male with a history of Anal intercourse with wife.

### Foreigners screened so-far include :

**Students** Among foreigners, students constitute bulk of those screened. 532 boys and 85 girls.

**Others** Two male Budhist monks and a wife of a foreign student.

The age and sex distribution of the people screened is as follow :

Age group (Yrs.)	M	F	Total screened
20 and below	144	59	203
21 - 30	489	128	617
21 - 40	63	9	72
41 and above	25	9	34

Eight sera have been found to be ELISA positive so far. Out of these 7 were repeatedly positive. 4 of these sera have been sent to Dr. Pradeep Seth, Department of Microbiology, All India Institute of Medical Sciences, New Delhi, for Western Blot confirmation. Results are awaited. The other 3 were found negative on Western Blot. The ELISA positive sera were from 7 males and 1 female foreign students. Two of these males belong to the under 20 years age group and the remaining 5 to the 21-30 years group. The female is 21 - 30 years.

## BOMBAY

**G.Bhave**

Seth G.S. Medical College

King Edward VII Memorial Hospital, Bombay.

ONE of the AIDS surveillance centres for Maharashtra is at Seth GS Medical College and KEM Hospital. After obtaining training at NICD in June 1986 the surveillance centre was established and started functioning within 2 months with the generous support from Bombay Municipal Corporation and encouragement by Dean, Dr. G.B. Parulkar.

Bombay is an important industrial city in the whole of Indian subcontinent with large floating population consisting of foreign tourists, foreign students and is also infested with problems like drug addiction, unemployment, poverty and prostitution. Bombay has an influx of 3000 prostitutes per year, 90% of these are migrants from Nepal, Bangladesh and other states. Bombay figure prominently in the map of the Asian sex tours organised by Western Travel Agencies and with the influx of Arab clientele it has added to the existing problem. All these numerous complex factors may contribute to an imminent epidemic of AIDS in India, if prompt and necessary preventive measures are not taken.

For a good surveillance of AIDS in India, the main high risk groups to be screened are prostitutes, homosexuals, drug addicts, patients attending STD Clinic and people who have travelled abroad.

Collection of samples from prostitutes is a tough job and requires good rapport either through social workers, through the welfare organisations for the prostitutes and through the practising physicians

in the red light area. A part time social worker was appointed and with her help more than thirty physicians practising in red light area were requested for their cooperation in collection of the samples from prostitutes. Also the secretaries of Nepali Woman's organisation and South Indian Women's Association were contacted for convincing the prostitutes for giving blood samples. Initially there was good response but later on due to local, social and political problems and quarrels in rival groups we could not visit the area for a long time. The work will be started again by the first week of November.

Bombay Municipal Corporation has special STD clinic in the red light area. Samples from this clinic as well as skin and VD department of Seth GS Medical College are regularly screened. We have drug addict clinic also in our hospital and samples from these patients are also screened. Few samples from resistant cases of Tuberculosis from Shiveri T.B. Hospital, Bombay were also screened but were not positive.

In addition to the screening of high risk groups for HIV antibody using ELISA kits from Wellcome diagnostics, some other parameters were studied, quantitative estimation of serum immunoglobulin using RID plates from Hoechst Pharmaceuticals. Quantitative beta - 2 microglobulin estimation was done by using ELISA kits for beta 2 microglobulin kindly supplied by Pharmacia, Laboratories, Upsala, Sweden on ELISA HIV antibody positive cases.

Results are indicated in the subsequent tables. In the different high risk groups maximum ELISA +ve results were obtained mainly in two groups, first one is prostitute and the second one is the patients attending STD clinics. Heterosexual promiscuity

is more common in India. The sexual contacts of this group to foreign tourists or with Indians who had been to developed countries is an important factor in developing infection. The group of these prostitutes in different states may form the main source of infection of HIV. From this reservoir, slowly and quiteley this deadly disease will spread in the population.

In the STD groups we had four repeated ELISA positive cases. Out of this, one is confirmed by Western blot technique. In other cases western blot results are awaited from NIV, Pune. This single western blot positive case is a young male only 21 years old. He had history of syphilis. He gave history of visits to prostitutes but has never gone out of Bombay. This case proves the prostitute group as a reservoir of infection. To our misfortune in-spite of explaining to the patient thoroughly about the importance of follow up, he is lost follow-up. Collection of the blood samples from prostitutes and their follow up is a difficult task in the HIV antibody surveillance and needs help and co-operation amongst dedicated social worker, social organisations and practising physicians. The only method of prevention of AIDS is "Health Education" both to the society as well as to prostitutes.

Quantitative estimation of serum immunoglobulins gives an idea of humoral immune status. There are number of reports of early elevation of serum immunoglobulins in HIV infection, sometimes even before the change in T4/T8 ratio is produced. In the samples studied by us all six samples showed raised immunoglobulins but two cases which were confirmed by western blot showed maximum rise in all three immunoglobulins. The assay of beta 2 microglobulins in HIV antibody +ve cases by ELISA test may help in predicting whether antibody positive

person will develop AIDS or not. Those with aggressive disease will always have raised beta -2 microglobulin levels. The normal level of beta -2 microglobulin is 2.5 mg/l. Out of 6 ELISA positive cases, it was raised in three cases. One case of foreign nationality and was a known case of AIDS. Other two were prostitutes. But the young boy from STD clinic (Indian, western blot positive) had beta - 2 microglobulin below 2.5 mg/l and clinically also he was symptomless. Two prostitutes with raised beta-2 microglobulins are difficult to trace.

Table 1 : Distribution of age in the high risk groups screened for HIV antibody.

Age in years	M	F	E	N.K.	Total
20 & below	215	132	-	-	347
21 - 30	257	237	-	-	894
31 - 40	355	113	-	-	468
41 & above	177	43	-	-	220
Not known	362	112	1	355	830
Total	1764	638	1	355	2759

NK = Not known

Table 2 : Number of persons in different high risk groups screened for HIV antibody.

Category screened	Sex	Screened	ELISA +ve	W.B. +ve
1. Homosexuals	M	2	-	-
	F	2	-	-
2. Heterosexually promiscuous		363	4	-
3. Drug abusers		13	-	-
4. Blood donors		1119	6	-
5. Recipient of blood/blood product		3	-	-
6. Persons on dialysis		261	2	-
7. Persons with symptoms of ARC/AIDS		2	-	-
8. S.T.D. patients		660	3	1
9. Miscellaneous:		170	1	-
Suspected cases (26)				
Tuberculosis (10)				
Sailars (65)				
Food handlers (27)				
HBsAg+ve (5)				
Kidney donors (50)				
Thalasaemia (4)				
Toxoplasmosis (9)				
10. Foreign students		105	-	-
11. Foreign personals		19	1	1
Total		2761	17	2

Table 3 : Age distribution in ELISA positives  
for HIV antibody.

Age in years	M	F	E	N.K.	Total
20 & below	-	1	-	-	1
21 - 30	2	-	-	-	2
31 - 40	-	-	-	-	-
41 & above	1	1	-	-	2
Not known	3	3	-	6	12
Total	6	5	-	6	17

Table 4 : Beta - 2 Microglobulin in ELISA positive samples for HIV antibody.

Level above 2.5 <u>mg/l</u>	3 cases
Level below 2.5 <u>mg/l</u>	5 cases

Table 5 : Immunoglobulin levels in HIV antibody positive persons

Category	No	Age	Sex	IgA mg/dl	IgG mg/dl	IgM mg/dl
<b>STD group</b>						
Indian	1	20	M	279.40	2710.5	267
Drug addict (Swiss National)	1	27	M	981.0	5044	313
<b>Female prostitutes :</b>						
	1	20	F	338.4	2192	200
	1	25	F	296	2059	184
	1	30	F	263	1929	184

## 6.5

### BOMBAY

**P.M. Khare**

Grant Medical College, Bombay.

BETWEEN November, 1986 and 1987, the Centre screened 817 sera. One of them was Western Blot positive at the reference centre, NIV, Pune. The specimen came from a 26 yr Male, Kenyan student studying in Marathwada University at Aurangabad. The person was unmarried. He had history of Malaria in 1978. The person admitted heterosexual promiscuity

with multiple partners as well as repeated contacts with prostitutes. The STD clinician detected inguinal and supra-trochlear lymphadenopathy along with 2 cm, soft to firm, non-tender hepatomegaly. Lymphnode biopsy was suggestive of Anglo immunoblastic lymphadenopathy. The Western Blot assay was strongly positive for p37, p24, gp41, p31, p51, p55, p66, gp120.

The Centre equates "repeated ELISA positive" to two samples of blood collected from the same person at two separate points of time. The case referred above fulfilled CDC criterion for AIDS. In addition, there are seven more sera with us that are once ELISA positive. Their break-up is: 2 foreign students, 2 HBsAg carrying Indians, 2 Indian STD cases and 1 Indian voluntary blood donor. On retesting them, if found positive, they will be sent to reference centre for W.B. test. Incidentally, repeat samples from one of the foreign students and the blood donor were negative by ELISA after an interval of 7 and 5 weeks respectively. In any case, W.B. assay of all these nine specimens, we believe, will be very interesting.

Some more specifications of our screening are pointed below:

1. Batch size 42 to 180 sera/batch, such 8 batches Av.90 sera.
2. Single, largest Bio-group Male 21-30 years (370/817)
3. W.B. positive sample from the same group.
4. Biodata not known
5. Single, largest risk group screened STD/HBsAg carrier cases 509/817.

Other risk groups screened were foreign students 195, Voluntary blood donors 101. More than half

foreign students came from Kenya, Jordan and Iran together.

Need for more conjugate diluent, glass distilled water, better chromogen and positive control sera in recent lots of the kit supplied were felt.

Guidelines regarding controversies on HIV antibody positivity are desirable.

## 6.6

### CALCUTTA

#### **M.S.Chakravarti**

School of Tropical Medicine, Calcutta.

AS per request from Govt. of India, vide a circular from Mr. S.S. Dhanoa, Secretary, Ministry of Health & Family Welfare, India through Govt. of West Bengal sometime in March, 1986, the Director, School of Tropical Medicine, Calcutta, who was also the Chairman, Committee for AIDS, West Bengal agreed for establishment of the above Centre.

Subsequently, the State Committee for AIDS, West Bengal met on two occasions and discussed in details the establishment of the Centre at Deptt. of Virology, School of Tropical Medicine, Calcutta, and proposed the name of Professor M.S. Chakraborty as one of the member of the said Committee & to act as Officer-in-Charge of the Surveillance Centre.

A contingency grant of Rs. 50,000/- was released to the Centre in the late part of July, 1986. The Centre was engaged in purchasing the essential equipments & in arranging the necessary laboratory

set-up, along with its safety measures for the initial few months. But the functioning of the centre was not possible for want to ELISA reader and ELISA test Kits.

The ELISA reader was made available to the centre in January, 1987 from NICD, Delhi. It could not start functioning for non-availability of necessary Kits from ICMR, and the shortfall in the number of Kits was also communicated to the centre by ICMR in the late part of March, 1987. The ELISA Kits however, were available on 9th June from NICD & the centre started functioning immediately after that.

The results of testing of serum samples from high-risk group for HIV antibody are sent regularly twice a month, to ICMR, and the Convenor of the State AIDS Committee is kept informed from time to time regarding the activities of the Centre.

## **Training**

1. Dr. P.N. Dey, Assistant Research Officer, ICMR Virus Unit, attached to the department of virology, School of Tropical Medicine, received training on "laboratory diagnosis of AIDS in a NICD/ICMR Joint Workshop" held at NICD, Delhi, from 16-20 June, 1986. Since then, Dr. Dey has been engaged in running the laboratory tests for AIDS of the Centre.
2. Dr. S.K. Chakravarti, Professor, Department of Virology, School of Tropical Medicine, Calcutta attended an Inter-Country Workshop on "laboratory techniques in LAV/HTLV screening" held at Bangkok, Thailand, from December 15-19, 1986, as a Government of India nominee, duly permitted by Government of West Bengal. This training of

Professor Chakravarti has further augmented the working efficiency of the Centre, who has been trained for confirmatory test of Western Blot technique also.

## Work done so far

As per guidance of ICMR, the serological screening for AIDS by the centre has been confined in (i) homosexuals & persons with promiscuous habits, (ii) apparently healthy individuals belonging to high risk groups, viz. patients attending STD clinics, (iii) blood donors, mainly professionals, (iv) suspected ARC cases.

Blood samples are regularly collected from STD clinics of different Government hospitals and also from private clinics. Donor blood, either from voluntary or professionals, are regularly collected from Central Blood Bank at Medical College Hospital, Govt. of West Bengal, and from a few other private Blood Banks. A few homosexual individuals and persons of promiscuous habits voluntarily submitted their blood to the centre for testing. Samples of blood from doubtful ARC cases have also been tested. The total collection of samples till October, 1987 has been provided in Table - 1 and the total number & category of samples tested with results have been provided in Tables 2 & 3.

Table 1 : Samples collected for AIDS test until October 1987.

Category of cases	No.collected
1. Homosexuals promiscuous	24
2. AIDS related complex (suspected)	4
3. Multiple transfusion	10
4. Foreign students	6
5. Foreign going Indians	2
6. Voluntary Blood Donors	59
7. Professional Blood Donors	28
8. HBsAg positive cases	47
9. S.T.D. cases	1742
Total	1922

Table 2 : Results of testing of sera from different categories of population for AIDS by ELISA

Category	No. tested	No. positive
1. Homosexuals & promiscuous	24	0
2. A.R.C.	4	0
3. Multiple transfusion cases	10	0
4. Foreign students	6	0
5. Foreign going Indians	2	0
6. Voluntary Blood Donors	59	0
7. Professional Blood Donors	28	0
8. HBsAg positive cases	47	0
9. S.T.D. cases	990	0
	1170	0

Table 3 : Age and sex-wise break-up of STD cases tested till date

Age group (yrs)	No. tested		No. positive		Total
	Male	Female	Male	Female	
20	92	62	0	0	154
21 - 30	302	103	0	0	405
31 - 40	105	18	0	0	123
41 & above	57	2	0	0	59
Not known	132	117	0	0	249
Total	688	302	0	0	990

## 6.7

### CUTTACK,

B.K. Bhuyan  
S.C.B. Medical College, Cuttack.

THE AIDS Surveillance programme is being conducted nationwide as a joint activity of the Union Ministry of Health and Family welfare, and the Indian Council of Medical Research.

Department of Microbiology, S.C.B. Medical College, Cuttack Orissa was identified as one of the AIDS surveillance Centres. The other centre of the state is the Regional Medical Research Centre, Nandan Kanan Road, Bhubaneswar.

One hundred and sixty three sera samples have so far been collected by this Department from high risk group for HIV Surveillance work. The details of these cases are as follows :

#### I. S.C.B. MEDICAL COLLEGE HOSPITAL, CUTTACK.

Persons attending STD clinics of skin & V.D. department with symptoms suggestive of ARC	- 84
Inpatients of Medicine Department with symptoms suggestive of ARC	- 30
Drug addicts	- 5
Receipients of repeated blood transfusion from professional blood donors	-5
Psychiatric patients	- 9
Foreign students from South Africa	- 1

#### II. INMATES OF CUTTACK CENTRAL JAIL- 29

The detailed case sheet was collected and completed for each case in a proforma printed as per the guidelines provided by the Indian Council of Medical Research. The relevant laboratory investigations including the haemogram, V.D.R.L. tests etc were also performed for each case.

Out of these 163 sera, 108 samples were sent to the Regional Medical Research Centre, I.C.M.R. Nandan Kanan Road, Bhubaneswar for the specific ELISA test after collecting their detailed case history in the required proforma and after performing the relevant laboratory investigations. As reported by the Director, RMRC, Bhubaneswar, all these 108 sera which were subjected to ELISA test are found

negative for the anti HIV antibodies. These samples were sent to RMRC, Bhubaneswar as per the instruction of the Deputy Director General (ECD) ICMR New Delhi since the infrastructure of the AIDS Laboratory in this Department was not fully equipped.

The remaining 55 samples of sera so far collected have been preserved in this Department for ELISA tests which are soon to be performed in this Department. Correspondance to this effect has already been done with the Deputy Director General (ECD), ICMR New Delhi for the ELISA Kit and it would be procured in the month of November, 1987.

## 6.8

### DELHI

**Arvind Rai & S. Kumari**  
AIDS Reference Centre  
National Institute of Communicable Diseases,  
Delhi.

NICD was recognised as one of the 4 AIDS Reference Centres in India in March, 1986. It is also functioning as a nodal point for the co-ordination of surveillance activity for AIDS throughout the country.

NICD pioneered the publication of a comprehensive book on AIDS for high standard professionals which caused widespread distribution and appreciation. A revised edition of the same was published as soon as the first few cases of HIV positives were reported from India. Subsequently a booklet for Health Care Personnel was also published in October, 1987.

A series of National Workshops and training courses

for epidemiologists, laboratory scientists and health administrators, have also been organised during the last 18 months, which generated immense enthusiasm and awareness of the disease. Each training included over 30 participants from States and U.T.s. The present workshop is the 4th in this series.

A massive campaign for laboratory based AIDS surveillance was lunched by NICD immediately after the six antibody positives were detected in Tamil Nadu. Since then we have taken lead in surveillance activities and have screened highest number of samples i.e. 6971 from high risk groups namely: prostitutes, jail inmates, I/V drug abusers, blood donors, hospital admissions from STD Clinics and patients who had received blood transfusion.

NICD is also co-ordinating the National Programme of AIDS by supplying ELISA kits and AIDS research equipments to all the recognised surveillance centres in the country. So far several hundred test kits and over 30 sets of equipments have been distributed to various surveillance centres.

### **Surveillance activity**

A total of 6971 individuals belonging to various high risk groups for AIDS were collected during July, 1986 and October, 1987 (Table 1). The samples were patients attending STD Clinics (3256), Jail inmates (416), drug addicts (49), Blood donors (1069), prostitutes (408 + 24), Hospital admissions (510), Leprosy cases (173), HBsAg positive individuals (134), Hostel inmates (24), positive contact cases (23), foreign students (626), foreigners (11), homosexuals (2), and from patients who underwent coronary bypass surgery were included in the study.

Table 1. Risk groups screened for HIV antibodies at NICD.

S.No.	Risk groups	No.tested	ELISA	W.B.
			+ve	+ve
1.	STD Patients	3256	3	1
2.	Homosexuals	2	-	-
3.	Jail inmates	416	-	-
4.	Drug Addicts	49	-	-
5.	Blood donor	1060	-	-
6.	Recipient of blood/ Blood products	32	-	-
7.	HBsAg positive cases	134	-	-
8.	Prostitutes	408	-	-
9.	Cases referred from various hospital	510	-	-
10.	Hostel inmates	24	-	-
11.	Leprosy cases	173	-	-
12.	Positive contact cases	23	-	-
13.	Foreign students	626	2	2
14.	Foreigners other than students	11	6	6
15.	Cross checking of samples collected from prostitutes in Remand house, Madras.	24	23	23
16.	Samples collected from Employees of ITDC, NBCC & TFM etc.	58	-	-
17.	Medical College, Trivandrum	38	-	-
18.	Medical College, Rohtak	90	-	-
19.	Gandhi Medical College, Bhopal	28	1	-
<b>Total</b>		<b>6971</b>	<b>35</b>	<b>32</b>

Eleven of the 6971 samples tested were found to be positive for HIV antibody by ELISA test but only 9 could be confirmed by Western blot. The details of the 6 HIV carriers and 3 full blown cases of AIDS conformed both by ELISA and Western blot detected at NICD are mentioned in Table 2.

Besides this, we have also been doing AIDS test and issuing certificates to various categories of Indians (ITDC, NBCC, IFAI) intending to go abroad on various missions as indicated in Table 1.

Table 2. HIV antibody positives detected at NICD until November 1987.

### HIV carriers

- i) A 27 yr. old male (Yugoslavian) who was imprisoned in Karnal Jail under narcotics Act - detected on 5.2.87.
- ii) A Tanzanian foreign student (33 yrs/M), seeking admission in Delhi University during July, 1987 academic session - detected on 8.7.87. The student has been deported.
- iii) An Italian lady (25 yrs./F) who was convicted in Trivandrum on charges of illicit drug smuggling - the case was detected on 1.7.1987.
- iv) One male adult (21 yr./M) of Indian Nationality attending STD Clinic in Trivandrum Medical College. Detected positive for HIV antibodies on 1.7.87. The person had the history of having spent some time in New York with his parents.
- v) Somalian foreign student (25 yrs/M) seeking

admission in Delhi University during 1987 academic session detected on 6th August, 1987.

- vi) A Canadian National (Male) referred from I.G. Medical College, Shimla. Detected ELISA positive on 29th September, 1987. Confirmed by Western Blot on 5th October, 1987.

### **Full blown cases of AIDS (confirmed clinically and serologically)**

- i) A 42 yrs. old male of Indian origin settled in Kampala (Africa) who was admitted in Civil Hospital, Ahmedabad at the time of investigation. Died of overwhelming opportunistic infections. Confirmed as AIDS case on 29.12.1987.
- ii) A 54 yrs. old male of Indian origin settled in New York for the last 25 years in teaching profession. He was undergoing treatment for mental illness in one of the South Delhi Nursing Homes at the time of investigation. Confirmed as AIDS case on 19.2.87. It was the first case of neurological pattern of AIDS in India. He went back to U.S.A. immediately after being detected as AIDS patient.
- iii) A Swiss national (30 yrs./M) imprisoned in Ajmer jail on charges of drug smuggling. He was positive for hepatitis B surface antigen as well. The patient was a case of gastro-intestinal pattern of AIDS as confirmed on 18.6.87. This person was also deported in consultation with Swiss Embassy.

## Referral Work

Besides above mentioned positives, NICD has also detected 23 HIV positives among Madras prostitutes, as part of AIDS referral service

## COMPARASION OF VARIOUS HIV ANTIBODY TEST KITS EVALUATED AT NICD

Following the detection of etiologic agent of AIDS - human T-lymphotropic virus type III (HTLV-III) or lymphadenopathy associated virus (LAV) - finally renamed as human immunodeficiency virus (HIV), a number of Commercial kits have been developed to diagnose the dreaded disease during early 80's. Primarily, the diagnostic kits were based on the detection of antibodies to HIV. Subsequently, sub-unit antigens and anti HIV sub-unit antibody tests - the Western blot (WB) - were also developed and commercialised which are currently being used as powerful diagnostic tools both in clinical and sub-clinical cases of HIV infection.

Since these tests have contributed a great deal both in diagnosis and surveillance of AIDS all over the world, obviously there has been debate as to which commercial kit should be used to achieve sensitivity and specificity nearing 100 per cent. In India, the surveillance of AIDS commenced abruptly in April, 1986 and HTLV-III EIA kit was chosen mainly on the basis of cost-effectiveness and shelf life. However, with the increasing awareness and far reaching implications, it became mandatory for us to undertake a well-designed study to evaluate some commonly used commercial HTLV-III/HIV kits, so that pros and cons of each of them in our laboratory conditions can be exposed. During this attempt, we have evaluated six different kits using

panel of positive, cut-offs and negative sera. These kits have been licenced in several countries for screening of blood donor sera, and are claimed to be highly sensitive and specific with high reproducibility rates. In our laboratory, we have screened over 7000 people, supposedly at high risk of exposure to human immunodeficiency virus and we have examined the usefulness of commercially available ELISA and WB kits for screening this type of population.

## **ELISA Kits**

The study included six different HTLV-III EIA kits (Wellcome diagnostics, HIV-TEK<sup>G</sup> of Flow Lab, Abbott EIA, Abbott visual immunoassay (VIA), Dispstick of Bio-Teck Research Lab and Abbott second generation env/CORE Recombinant kit) and positive tests were compared with Western blot kit produced by Du Pont, USA. The tests performed and evaluated according to manufacturer's instructions. The detailed characteristics of each kit are mentioned in Table 3.

Type of assay in case of Wellcome and Abbott env/core Recombinant kits was competitive ELISA whereas in case of other kits, it was an indirect assay.

## **Western Blot assay**

The Western blot (WB) assay for confirmation of samples found reactive in any of the ELISA kit was done using commercial Du Pont WB kit manufactured for the detection of anti-HIV sub-unit antibodies.

Nitrocellulose membrane strips containing sub-unit fractions of HIV were reacted with patient serum

overnight in sample dilution buffer. The strips were washed three times in washing buffer and incubated with first conjugate, washed and again incubated with second conjugate supplied with the kit. Finally, the substrate was added to yield colored bands of proteins corresponding to various components of HIV. By definition, reference positive sera exhibited all major components e.g., gp160, gp120, p65, p51/55, gp41, p33, p24 and p17. Any sample containing atleast two major and two minor of these components was labelled as positive.

### Patient sera

A total of 376 test sera were selected randomly for evaluation study. These were chosen out of 5338 high risk samples initially screened for HIV antibodies in our routine laboratory using commercial Wellcozyme HTLV-III EIA kit (Table 4). Besides this, reference positives, cut-offs and reference negatives, provided in each kit were also included during each assay to ensure that the particular kit worked satisfactorily. Out of 376 sera used for comparison of kits, 30 were confirmed positive for HIV antibodies previously on the basis of western blot results. During the current study, each sample was tested with individual commercial kits as per the manufacturer's indications. Any positive sample with a particular kit was retested three times with the same kit to ensure reproducibility.

### Results

The result of comparative evaluation of various test kits is shown in Table 4. According to the confirmatory western blot test, 30 sera out of a total of 376 contained antibodies to HIV/HTLV-III. Different binding patterns of anti-HIV/HTLV-III were

Table 3 : Characteristic features of HIV test kits used for evaluation.

Manufacturers	Wellcome	Flow Lab	Abbott EIA	Abbott VIA	Bio Tech Research Lab	Abbott env/core	Du Pont WB
Product	Wellcozyme HTLV-III EIA	HIV-TEK G	HTLV-III EIA	HTLV-III VIA	Dip-Stick	env/core Recombinant ELA	Western blot
Solid phase	Microwells	Microwells	beads	beads	Sticks	beads	Nitrocellulose
Enzyme	HRP	HRP	HRP	HRP	HRP	HRP	HRP
Substrate	Tetramethyl benzidine (TMB)	TMB	OPD	OPD	TMB	OPD	4-chloro-1 naphthol
Wave-length for taking OD values	450nm	450 nm	490 nm	Visual	Visual	490 nm	Visual
Serum dilution	1 : 4	1:100	1:40	1:40	1:5	1:4	1:100
Type of assay	Competitive EIA	Indirect ELISA	Indirect ELISA	Indirect ELISA	Indirect ELISA	Competitive ELISA	Indirect assay

Table 4 : Comparative evaluation of various HIV test kits.

Risk groups	Sera used for evaluation	No. of samples positive for HIV antibodies by					
		Well- cozyme	HIV-TEK G	Flow Lab EIA	Abbott env/core	Abbot VIA	Dip Stick Kit
Blood donors	86	-	2	1	-	-	ND
Prostitutes	24	23	ND	23	23	23	ND
Jail inmates	2	2	2	2	2	2	ND
Foreign students	260	2	3	5	3	3	10
STD Patients	1	1	1	1	1	1	ND
Suspected patients referred from hospitals for AIDS test.	2	2	2	2	2	2	ND
TOTAL	376	30	10*	34	31	31	10*
ND = Not done.							30

found in commercial ELISA kits. The extent of false positivity, false negativity, sensitivity and specificities of different kits were assessed presuming western blot results as 100% true.

### **False positive results.**

Any positive result in ELISA kit that was not positive in WB was considered false positive. Considering this fact, at least 3 samples in HIV-TEK<sub>G</sub>, 4 in Abbott EIA, 1 in Abbott VIA, 1 in Abbott env/core and as many as 8 in Dip-Stick kit, yielded false positive results. All these "false positive" samples remained negative in comparative assay of Wellcozyme. However, if Abbott env/core (which is a second generation kit based on recombinant env and core antigens of HIV) is taken as standard over WB, Wellcozyme kit missed the detection in one case, but this Wellcozyme "missed" case should remain doubtful for two reasons - firstly, this sample yielded weak positive reaction against "core" antigen only in Abbott env/core kit, and secondly, the sample remained negative in WB. The discrepancies within various ELISA kits except Dip-Stick were within permissible range; the results of Dip-Stick kit were quite inconsistent and unreliable as can be seen in Table 5. And that is why we did not do Dip-stick for all the 376 samples.

### **False negative result**

An ELISA result was considered false negative, if the sample gave "negative" result in ELISA but clearly "positive" in W.B. This condition, however, was not encountered during evaluation with 376 samples in the present study.

Table 5 : Discrepancies in results of different HIV kits\*

Sample No.	Wellco-zyme	Abbott		Flow Lab HIV-TEK G		Dip-Stick Assay		WB Du Pont
		EIA	VIA	env/core				
1.	-	+	+	+ (?)	-	-	-	-
2.	-	+	-	-	-	-	-	-
3.	-	+	-	-	-	-	-	-
4.	-	+	-	-	-	-	-	-
5.	-	-	-	-	+	-	-	-
6.	-	-	-	-	+	-	-	-
7.	-	-	-	-	+	-	-	-
8.	-	-	-	-	-	+	+	-
9.	-	-	-	-	-	-	-	-
10.	-	-	-	-	-	-	-	-
11.	-	-	-	-	-	-	-	-
12.	-	-	-	-	-	-	-	-
13.	-	-	-	-	-	-	-	-
14.	-	-	-	-	-	-	-	-
15.	-	-	-	-	-	-	-	-

\* This does not include the samples which yielded positive or negative results consistently in all kits.

## Discrepancies and correlation in results.

There were 15 samples which yielded discrepancies in results (Table 5). Wellcozyme and Abbott env/core kits correlated almost 100 per cent with WB results. Four samples which were positive in Abbott EIA were negative in other kits, except 1 which was also positive in Abbott VIA. Similarly, another 3 samples which were positive in HIV-TEK<sub>G</sub> kit, turned negative in other kits. Dip-stick assay yielded the most unreliable results with as many as 8 false positives.

Individual merits and demerits of each kit were also experienced during evaluation and will be discussed in the following text.

The current practice of HIV/HTLV-III screening has wide potential in control of spread of AIDS virus infection for two important reasons. Firstly, the etiologic agent of AIDS is now known and routes of transmission have been firmly established. Secondly, HIV infected persons can be identified by commercially available screening tests. Such kits have been efficiently employed both for screening of blood donors and for evaluation of antibody status of patients.

The discrepancies in sensitivities and specificities of different HIV kits as seen during the present study were expected due to diversity in production methods and other test conditions. Nonetheless, our findings closely match with the findings of other researchers who have done such evaluation studies. Except Dip-stick kit, all other assay yielded quite satisfactory results. During our study, we found Wellcozyme and Abbott env/core kits the best.

Wellcozyme had an edge over Abbott env/core in that it took much less time to complete the test, though in principle, Abbott env/core should be preferred as it would have the least chances of missing the detection of HIV antibody. Abbott EIA, VIA and HIV-TEK<sub>G</sub> also seemed as if they would not miss any positives compared to Wellcozyme but the more number of "false positives" that they detected needed confirmation by WB; thus increasing the cost per test.

Under such circumstances, one should have greater hope out of second generation tests, which employ DNA recombinant HIV material. This may improve the specificity and reproducibility of currently available ELISA and WB kits.

### **Problems faced by NICD during Surveillance of AIDS**

As part of the National AIDS Control strategy and ICMR Task Force on AIDS, surveillance work was intensified across the country from July, 86 onwards. Since then our Institute has experienced the advantages and problems both on the selection of risk groups as well as the merits and demerits of various commercial kits. Initially, the inflow of samples, both actively and passively, was fairly good and we did not face any problem in getting large number of sera from various sources concerned with medical health care..

We will discuss our experience under two main heads:

- i. Risk groups and AIDS surveillance.
- ii Suitability of AIDS test kits and new developments.

High risk groups were identified based on the epidemiological data of other countries where the

problem of AIDS was more grave. However, these groups, in Indian situation did not work in toto and therefore, a national agreement was reached to start the surveillance mainly amongst the following groups.

1. Prostitutes.
2. Patients attending STD clinics.
3. Blood donors.
4. Suspected cases referred from hospitals.
5. Jail inmates
6. Patients who underwent by-pass surgery.
7. HBsAg carriers.
8. Foreign students.

We have covered all the above mentioned groups and besides, we have also expanded our target groups to chronic tuberculosis, chronic fungal infections and leprosy etc.

So far, we have screened 6971 samples from various high risk groups.

While screening the above risk groups, we feel that we have still not covered many important target groups like: -

- Haemophiliacs
- Repeated transfusion recipients.
- Homosexuals
- I/v drug abusers.
- Transplant recipients
- Leukaemia patients
- Really identified professional blood donors.
- Foreign tourists.

Looking at the incidence of HIV in Delhi, based on our data, we feel that there is an urgent need to revise our target risk groups. Since a handful of HIV Ab positive cases in Delhi seem to be of

imported nature, we should give major emphasis on TWO major groups.

- a) Searching for imported cases by various means to identify sub-clinical cases.
- b) Looking for full-blown or ARC cases mostly through hospital admission cases of various nature.

There is also a need to device means by which true i/v drug abusers, homosexuals, true professional blood donors and identified prostitutes can be made available for AIDS test.

### Problems in Sample Collection

1. We have realised that getting samples from most of the risk groups has been extremely difficult. It was possible only through our ACTIVE efforts that such a large number of samples could be screened. Of course, initially some samples were arranged passively through "Delhi Administration", but subsequently they have stopped.
2. Moreover, we feel that most of the blood donor's samples were not from actual professional donors and the same may be true for prostitutes. Therefore, we must ensure that criterion may be strictly followed.
3. Secondly, whenever the samples were sent to us, many times they were not packed in ice and none were labelled as "Hazardous material".
4. As many as 20% samples were found to be haemolysed.
5. Since HIV is sensitive to heat and even for

antibody determinations, transport in ice is essential, there should be a firm recommendation to strictly adhere to these guidelines.

6. While collecting sample from transfusion recipients, we must take the history of several years instead of few months; because it is now clearly known that even those, who received transfusion 5 years ago or even before may also develop the disease.

7. Most importantly, We feel that almost all centres may have faced problem in sample collection due to the lack of SKILLED health care workers and technical staff. This must be taken into account.

8. We have experienced that exposure of test kit to atmospheric temperature even for 2-3 hrs. at-times, often inactivated the kit. Therefore, while carrying even by air, the kits should be transported in ice.

9. We all should have strict vigil over the lab. staff to ensure that the used materials are decontaminated before throwing.

## 6.9

### **GUWAHATI**

**P.C. Mahanta**  
Gauhati Medical College, Assam

THE AIDS Surveillance Centre at Gauhati Medical College started functioning from the middle of 1987. The apparent delay in the functioning was due to some teething problems encountered in establishing the Centre viz., procurement of equipments,

accommodation, manpower, etc.

In Guwahati, the easternmost city of the country, there is no dealer of equipments like micropipettes, disposable tips etc. and we had to place the order for supplying these items with a firm in Delhi which took a long time in supplying the same.

The Department of Microbiology, Gauhati Medical College, which has been entrusted to run this Centre is in a developing stage, with only six members in its teaching staff. The department, situated at the top of the Narakasur hill, has only a few rooms for the departmental works and faculty members. Hence, the Surveillance Centre had to be housed in a room allotted by the Principal, GMC, in the GMC Hospital complex at the foot-hill. This of-course made the Centre accessible for all.

In view of the limited teaching and technological staff of the department we have yet to overcome the manpower problem because the staff of the department frequently needs to be engaged in epidemic duties in various parts of the State besides their usual academic programmes for undergraduate & postgraduate students of Medical College, Dental College and Nursing College and other hospital services. However, one technician has been engaged for collection of blood samples from professional blood donors and cases attending STD Clinics. The Govt. of Assam has been moved for appointment of personnel for manning the Surveillance Centre and the matter is in process with the Government.

The Centre has so far screened all the professional blood donors of the city and a number of patients attending STD Clinics (275). No seropositive case has been detected among the cases screened so far.

Meanwhile, circulars informing the availability of facilities at this Centre for screening of people of High Risk groups for AIDS were issued to all the District and Subdivisional Medical & Health officers of Assam as well as well as the Directors of Health Services of the neighbouring States. Similar circulars were also issued to the Clinicians at the medical colleges of this region. Public awareness programmes on AIDS along with public information about the screening facilities available at this Centre have been telecast/broadcast on several occasions through the local (Guwahati) centres of Door-Darshan and All India Radio.

This AIDS Surveillance Centre at Guwahati Medical College now being better organised, we intend to intensify the screening programme. Arrangements are being made to collect samples from different parts of the city and some pockets in the district level.

## **6.10**

### **MANIPUR**

**Ng. Brajachand Singh,  
Regional Medical College,  
Imphal, Manipur.**

#### **A. Important events for bringing AIDS awareness in Manipur**

THE Indian Medical Association, Manipur State Branch have organised a state level seminar on AIDS on 8th June 1986 and I was invited to talk on the topic "Diagnosis and Surveillance of AIDS". Many relevant points have been discussed amongst the doctors to bring public awareness about AIDS in Manipur.

## **B. Steps to set up Surveillance Centre for AIDS at R.M.C. Imphal**

I have attended the National workshop on "Laboratory Diagnosis of AIDS" at the National Institute of Communicable Diseases" Delhi on 16-20th June 1986.

(2) I have conducted a miniworkshop on "collection and transport of blood" for the diagnosis of AIDS at Regional Medical College, Imphal on 18th July 1986. This workshop was attended by the Blood Bank Medical Officer, Psychiatrists, venereologists and technicians of Manipur Health services/R.M.C. Imphal and they have been trained regarding the procedure of blood collection and despatch of sera to the surveillance centre.

## **C. Initial Activities of the Surveillance Centre Before Facilities for Doing ELISA test Existed Here**

(1) Started despatching serum samples to National Institute of communicable diseases, Delhi for testing of HIV antibody on 27-7-86 and the Institute kindly agreed to do testing of the samples despatched from this centre. A total of 122 sera collected from High Risk Groups have been sent to NICD Referral Centre before the collection of ELISA Kits and ELISA Reader by the centre.

(2) State AIDS Cell has been identified at Medical Directorate, State Health Services, Govt. of Manipur and Co-operation has been seeked from this cell to help in the setting up of surveillance centre for AIDS in Manipur.

(3) Trained one Health Personnel from Nagaland, for the collection and despatch of blood samples from Nagaland.

## D. Plan for Design of AIDS Surveillance

The design of the study is so called purposive sampling where we select probable high risk groups like intravenous drug addicts, heterosexually promiscuous patients (males and females), homosexuals, Blood donors from various districts of Manipur. The two districts, Imphal district and Churachandpur district are mainly selected because of the fact that the high risk groups are mainly concentrated in these parts of Manipur and hence the purposive sampling is done irrespective of the district wise distribution of Manipur. The high risk groups have been selected from the inmates of the Sajika Sub-Jail (Khabeisoi) and Central Jail, Imphal where many intravenous drug addicts are kept. The instrument used for data collection was a well devised proforma as designed by "Indian Council of Medical Research". The method of data collection was personal interview. Only selected individuals are subject to ask predesigned questions found in the proforma by different checking techniques to ensure that the information was correct. The blood samples are brought to the department of Microbiology R.M.C. Imphal and the sera separated under aseptic precaution, stored properly till they are subjected to HIV antibody detection at this centre.

### Selection of subjects

1. Intravenous drug abusers:
  - i) Central jail, Imphal.
  - ii) Sajika Sub-Jail, (Khabeisoi).
  - iii) Drug deaddiction camps at Sugnu, Thoubal, Ketricao etc.

- iv) Churachandpur Police Station & hospital.
  - v) R.M.C. Hospital.
  - vi) Central District Hospital
2. Heterosexually promiscuous patients:
- i) S.T.D. Clinics at R.M.C. Hospital and Central District hospital and private clinics located at imphal.
  - ii) Areas mentioned as in the case of intravenous drug abusers.
3. Recipients of repeated blood transfusion :
- i) R.M.C. Hospital, Imphal.
  - ii) Central District Hospital, Imphal.
4. Blood donors:
- i) Blood Bank, Central District Hospital
  - ii) Blood Bank, R.M.C. Hospital.
5. Prostitutes and Homosexuals :
- i) Central Jail, Imphal.
  - ii) S.T.D. clinics at R.M.C. Hospital and Central District Hospital.

### The Problem of Intravenous Drug Addicts in Manipur

"Prevention of Spread of the human immuno deficiency virus (HIV) must take priority over any perceived risk of increasing drug misuse",

recommended the scottish committee on HIV infection and Intravenous drug use set up because so many intravenous drug users from Edinburg were infected with HIV. Similar conclusions have been reached in the United States, where the acquired immune deficiency syndrome ( AIDS) was reported in drug users in 1981. What is most alarming in the United States is the heterosexual spread of HIV among drug users to the rest of the population.

Imphal, the capital of the border state, Manipur is a transit town of elicit drug trafficking of golden trangle. This small state with only 15 lacs population is having two serious problems viz. drug addiction and alcoholism. Heroin has become the choice of abuse in recent years and there is a dramatic increase of heroin addiction among the younger generation. Till May 1987 there are 1320 identified heroin abusers. We have reason to believe that the total number of estimated heroin abusers is around 10-12 thousands. Heroin is dissolved in any available water and injected, with a syringe and needle or an inkdropper attached with the needle, intravenously by self or by a friend. The worst affected areas are Imphal, Morrang and Churachandpur. Keeping these points in mind an attempt has also been made to screen intravenous drug abusers in Manipur for exclusion of HV antibody in the blood among these abusers.

### **AIDS Surveillance Activities at Regional Medical College Imphal**

Serum samples from a total of 813 individuals belonging to various defined "High Risk Groups" for AIDS were collected and tested for HIV antibody during September 1986 to September 1987. Of them 708 were males while the remaining 105 were

Table 1: High risk groups screened for HIV antibodies

Sl. No.	High Risk Group (HRG)	No. tested	No. found HIV+ve
1.	Heterosexually promiscuous patients (from patients attending S.T.D. clinic)	301	-ve
2.	Drug addicts (intravenous)	304	-ve
3.	Recipients of repeated blood transfusion.	108	-ve
4.	Blood donors	85	-ve
5.	Homosexuals	10	-ve
6.	Unclassified	5	-ve
	Total	813	-ve

females. The majority of the individuals belonged to age groups 21-30 years. The testing for HIV antibodies is done by enzyme linked immunosorbent assay (ELISA) using wellcozyme HTLV - III ELISA Kits. The ELISA Kits have been provided by Indian Council of Medical Research, New Delhi and the ELISA READER has been provided by Directorate General of Health Service (DGHS), Govt. of India through National Institute of Communicable Disease, Delhi. The results were recorded both visually and by the ELISA READER (Titre Tek) at 450 nm. Patients attending sexually transmitted diseases (STD) clinics had presumably more than one sexual partner and the heterosexually promiscuous patients have been selected from these clinics. Drug addicts included in the study were parenteral drug users and many of them gives history of being jail inmates as part of their treatment.

Table 2: Age and sex distribution of high risk group individuals screened for HIV antibodies.

Sl.No.	Age in years	Male	Female	Total
1.	Less than 20	109	20	129
2.	20-30	501	72	573
3.	31-40	82	7	89
4.	41 & above	16	6	22
		708	105	813

## **Problems Encountered**

1. Difficulty of collection of ELISA Kits from I.C.M.R.
2. Non Availability of Kits Regularly.
3. Difficulty Encountered in Collecting Blood Samples:
  - i) Fear psychosis among the people about AIDS and refusal to allow blood collection for testing.
  - ii) Bad communication system at Imphal and high cost in transport system in the attempt to collect blood samples.
  - iii) No identified prostitution houses and red light areas.
4. No Manpower in the Department for AIDS surveillance as there is no extra persons employed for the centre. Hence, ICMR should approve employment of staff for the centre on wage basis.
- 5) Repair of Instruments

## **Acknowledgements**

1. Principal, R.M.C. Imphal.
2. Director of Health Services, Govt. of Manipur.
3. Nodal Officer, State AIDS cell, Govt. of Manipur.
4. Indian Council of Medical Research for supply of ELISA Kits and grant - in - aid for the surveillance centre.
5. Directorate General of Health Services, Govt. of India for the supply of ELISA READER.
6. National Institute of Communicable Disease, Delhi

## JABALPUR

Rita Mathur

Regional Medical Research Centre, Jabalpur.

THE Regional Medical Research Centre, Jabalpur was identified as one of the centres for AIDS surveillance in Madhya Pradesh. A workshop on laboratory diagnosis of AIDS was organised at the National Institute of Communicable Diseases, Delhi in June '86, which was attended by Microbiologists of all the surveillance Centres. The ELISA readers and kits were then provided to the centres for carrying out the surveillance activity. This Centre was given the equipment in November '86.

In response to the order of the Government of India, the Principals of various colleges in Jabalpur approached us in September '86 for sero-surveillance of the foreign students of their colleges. Collection of blood samples from the high risk groups was thus initiated.

### Blood Collection

Initially there were practical difficulties in collection of blood. No doctor/technician was available in the Colleges/University who could collect the blood samples and send the sera to our laboratory for analysis. From this Centre no one could be sent for this purpose as no additional staff or funds had been provided. Blood collection was therefore undertaken in this laboratory with the existing staff. The Principals of various colleges were informed to send students in batches of 20-30 per day. When the first case of AIDS was detected, a large number of foreign students came forward for analysis and

daily blood samples were collected from as many as 100-150 students.

## **ELISA Kits**

The ELISA kits were obtained from ICMR Delhi as and when required. There were some minor difficulties in transportation of the kits. We obtained these through the staff members who happened to visit Delhi for some official work.

## **Screening of High Risk Groups**

So far 1638 persons belonging to different high risk groups have been screened (Table). These include 255 Indians. The foreign students were detected to be positive for HIV antibody by ELISA.

The life style of most of the African students is highly promiscuous and a majority of those interviewed gave a history of multiple sexual partners. However, rare of the students were homosexual. Most of the students also gave a history of having had Primary Chancre but they had taken prompt treatment.

VDRL test was done on 1600 sera samples and 113 were found positive. Some students with a history of STD were found negative by VDRL.

## **Reporting**

The reports of cases confirmed to be positive by ELISA and Western Blot communicated under confidential covers to the following:

1. The College Principal,
2. Senior Deputy Director General, ICMR,

3. Collector, Jabalpur,
4. Joint Director Health, Jabalpur.
5. Chief Medical Officer, Jabalpur.
6. Director, Health Services, Government of M.P., Bhopal.
7. Assistant Director General (AIDS) DGHS, New Delhi.

## Racial Discrimination

Another important problem faced by our centre was of a socio-political nature. A large proportion of foreign students here are from African countries. They felt that compulsory AIDS testing was discriminatory being imposed mainly to disqualify African Students.

We had detailed discussions with a number of students, individually and in groups, when they visited our laboratory for AIDS testing. They were explained in simple terms why surveillance programme was initiated. There was no discrimination involved as all the foreign students were being tested. We also held discussions with representatives of Kenyan students in order to pacify them and allay their anxiety. In due course, a good rapport was built up and we were able to win the confidence of the students.

## Surveillance

An AIDS surveillance committee consisting of the Chief Medical Officer, Experts of Medicine, Pathology and Preventive Medicine departments of Medical College and Microbiologists of RMRC was formulated by the Dean, Medical College. Screening of local contact of seropositive cases and prostitutes was

Table

Total number of sera analysed for HIV antibody by ELISA at the Regional Medical Research Centre, Jabalpur upto 10th November '87.

Country	No. analysed	+ve
Kenya	878	10
Jordan	164	Nil
Sudan	244	Nil
Palestine	9	Nil
Iran	16	Nil
Djibutia	1	Nil
Kuwait	1	Nil
Behrain	1	Nil
Yemen	4	Nil
Uganda	1	Nil
Ethiopia	26	Nil
Somalia	14	Nil
Nepal	3	Nil
Nigeria	17	Nil
Tanzania	4	Nil
India	255	Nil
	1638	10

VDRL done on 1600 samples  
 VDRL +ve 113 (20 Indians)

discussed. It was decided that the CMO with the help of state Government paramedical staff would arrange to send the blood samples of prostitutes to this centre. However, no definite progress has been made on this front.

Discussions were held with the local Jail authorities regarding the importance of sero surveillance of the jail inmates, specifically those who are known to be homosexuals, or prostitutes. Blood samples are being screened from these groups.

## 6.12

### LUCKNOW

**Asha Mathur**  
K.G. Medical College, Lucknow.

AS a part of National AIDS control strategy an AIDS Surveillance Centre was established at the Department of Microbiology, K.G. Medical College, Lucknow. The ICMR provided the following equipments for doing the ELISA tests.

1. Titertek Microtitration Equipment : HANDIWASH 100
2. Titertek Multiskan Plus : ELISA Reader
3. Titertek Microtitration Equipment : Multichannel Pipette -8 Channel.

The kits for doing the tests are imported by the ICMR and provided to the Centres. We had received the first kit from the ICMR in March, 1987. As of October, 1987 a total of seven kits have been

received.

According to the plans made, the Directorate of Health was to collect the sera from the vulnerable groups and supply to the Surveillance Centre here for testing. The staff of this Centre have themselves collected 438 sera from the following category of individuals.

Homosexuals	4
Heterosexually promiscous	48
Bisexuals	1
Corrective Institute Inmates	85
Recipient of blood/blood products.	4
Persons on dialysis	3
Blood donors	230
Foreign students	56
ARC	1
Miscellaneous	6

The results of the ELISA test done so far are as follows:

Total sera collected	438
ELISA Positive	1

V.D.R.L. test was done on certain sera and a total of 8 sera have tested positive.

The ELISA positive result was obtained in the patient whose details are given below. This patient went to All India Institute of Medical Sciences, New Delhi, where the diagnosis of AIDS was confirmed. The details of the case reported ELISA positive are :

Indian, aged 29 years, travelling Salesman by occupation in Africa with a history of multiple heterosexual contacts.

He had signs and symptoms suggestive of AIDS as follows :

Oropharyngeal candidiasis, fungal pneumonia, severe proctitis and colonic ulceration.

Besides the above he had severe weight loss, cough, fever and debility.

Laboratory investigations revealed :

Total leucocytes count :  $9,600/\text{mm}^3$

VDRL test Negative

Serum Immunoglobulins IgG 1966 mg/dl  
IgA 335 mg/dl

Diff. leucocytes count Polymorphs : 77%  
Lymphocytes: 17%  
Eosinophils: 00%  
Monocytes : 06%

**Plan for AIDS control**

After the detection of one case of AIDS at Lucknow (U.P.), identification of high risk group in community

is necessary. Uptill now the study shows that the high risk group persons are those visiting foreign countries, therefore:

1. It is necessary to test blood of (i) the foreign students and (ii) Indian residents visiting foreign countries.

As most of the foreign students refused to give blood samples, it should be mandatory to have their blood report before they are admitted to the Institutions.

2. As very few cases of AIDS have been diagnosed in India, it will be helpful if all persons seeking for visa to visit India should be tested.

3. To include Social and Preventive Medicine Departments to help in collection of the specimens.

4. There is a need to educate the people about the facts of disease and preventive steps.

5. Identification of high risk group in the State.

6. Information and education of people by involving different media and health education channels.

7. Strengthening the AIDS Surveillance Cente in State. Additional staff to collect the sera from different cities of U.P., specially those cities which are good tourist spots e.g. Varanasi etc.

**MADRAS****Suniti Solomon & Sundara Raman**Institute of Child Health & Hospital for Children  
Egmore, Madras.

JULY 1987, saw the birth of yet another surveillance Centre, for serosurveillance of AIDS in India and a second such centre in the city of Madras. The Centre, commissioned with a view to screen the crossection of HRG, started full stream in the first month itself and as many as 300 samples were collected and 270 screened and four seropositive cases were detected by ELISA and later confirmed at CMC Vellore by the W.B.

The Centre had soon set itself a task right earnest and began on a road to delineate the object possibilities of effective screening.

At the outset since the liaison between several areas of HRG to be screened and the principal investigator had been established in the past years experience at the MMC Centre expansion on it was not a major problem.

The priority was screening of prostitutes who were a major chunk which turned out to be the largest number of positive cases in Tamil Nadu efforts were made to step up, the same. With great help from the Police Department and especially the Vigilance and anti vice squad a number of them were subjected to the test as and when they were apprehended at the Police Commissioner's Office itself. Efforts are in progress to screen an average of 100-150 prostitutes a month.

The other segments included

1. a) The STD departments of various teaching institutions.

b) District headquarters hospitals.

c) Peripheral STD clinics.

Both regular OPD attendings and VDRL reactive individuals were screened and the number of samples are on the rise with an average of 50 samples/Week.

2. From the Obstetrics & Gynaecology side the primigravida who are reactive to VDRL, illegal abortion cases, Bad Obstetric history cases and repeated abortions and abortion requesting unmarried women were also being subjected to screening there is a slow and steady flow of samples.

3. Screening of paid donors from various government run hospital blood banks were also targets. More so in HBsAg and VDRL reactive donors.

An average of 40/60 samples a week is received and this is being augmented. To begin with an initial start has been made with

1) ICH & HC Blood Bank Egmore

2) Maternity Hospital, Egmore

3) KGH Maternity Hospital Blood Bank, Triplicane

4) Royapettah Hospital Blood Bank

5) RSRM Blood Bank North Madras

6) Stanley Medical College Blood Bank

A few more are to be added shortly to the list.

4. With growing necessity to screen foreign students the centre is planning to send circulars through the hospital to various city and mofussil colleges. Meanwhile since at the MMC Cente this is being well handled for the past one and half years this did not much constitute as priority for fear of overlapping.

5. Though patients with terminal cancer especially leukemias and lymphomas were earlier screened at the Centre at MMC and in a pilot study of fifty cases none were found positive, now, after the confirmation of AIDS on a 55 year old male patient with lymphoblastic leukemia of immunoblastic type recently, a massive launch has been made in liason with the Cancer Institute, Adyar where from both inpatients and out-patients are being screened for initial number of 200 cases are to be studied.

Efforts are being made to screen a very promiscous male population of lorry drivers who could possibly be transporting the virus also. In the next few months this is going to be concentrated in Villipuram, Ulundurpet, Dindivanam, Salem areas since the early cases of female prostitutes are from there and they give history of regular customers as lorry divers.

Regarding homesexuals an attempt is made towards the major group of Jail inmates at the central Jail and elsewhere, especially on the persons who have been for over three years and above.

Among the paediatric age group patients receiving repeated blood transfusions in the haematology department especially with haemophilia and Thalasemia are being screened. The initial number

**A View of the Number of Cases Screened by this Centre and  
the Monthwise Break up**

Month	Cases Screened	Positive ELISA	Positive WB	Source of case
July	270	4	4	Vigilance home - 4 Female Prostitutes
August	270	3	3	Vigilance home - 2 Female Prostitutes
				STD OPD Male - 1
September	369	4	4	Vigilance home - 2 Female prostitutes (through STD)
				Cancer Patient - 1
				Contact of patient - 1
October	610	Nil	Nil	- Nil -

of sera received is only about 15 per week. The other cases of congenital syphilis and babies with severe infections are also being screened.

There are certain number of promiscous persons who seek voluntary screening and this is only a fraction.

Though several areas are being explored, screening of women prostitutes and STD clinic attendings who have been the majority of positive cases, remain the priority alongwith the screening of contacts of seropositive cases.

Lastly attempts are being made to screen IV drug abusers through voluntary agencies and mental hospitals and psychiatry OPD.

In our experience we have found that the crossection of individuals screened are from the low or the lowest Socio-economic group and hence the screening of the higher socio economic group is necessary and possibilities are being explored.

## The Laboratory and the Test

With minimum facilities and an increasing number of serum collected for screening almost 3 to 4 kits are put up per fortnight at the ICH Centre.

After the influx of sera from the blood banks pooling of sera is being attempted and evaluated. This could well be an advantage in producing a cost effectiveness.

Great care is taken to avoid any kind of contamination and the lab workers are screened at

Total Sera tested from July to Oct 30th = 1519 No.  
of Sera Positive by ELISA and W.B. 11

Homosexuals	5	None Positive
STD OPD	457	One Male Positive
Bisexuals	Nil	Nil
Vigilance home Prostitutes	48	8 Female positives
IV Drug Users	Nil	
Blood Donors	197	Nil
Recipients of Blood/Products	36	1 Female Positive (could possibly be because contact of positive cancer patient)
Cancer Patients	6	1 Male Positive
Voluntary Screening	119	Nil
TB Clinic & Sanatoria	50	Nil
Unknown Age Sex (STD & Donors)	600	Nil

One of the female positive prostitute is pregnant  
and expected to deliver by December 1987.

intervals. There has been no incident of contamination or contact.

### **Follow up of Seropositive cases**

The few cases housed at the Vigilance home are being effectively followed up for possible early detection of ARC or AIDS. None of the cases followed up so far has shown any frank clinical spectrum. They are screened for all possible intercurrent associated problems, though a few showed isolated incidents of fever and sore throat no significant problem is noted. They are being regularly sent to the general medical OPD for thorough clinical exam. Some (two) of the seropositive cases have gone untraced. Efforts are still in progress to trace them and provide a food follow up. As far as the pregnant seropositive women goes the MMC centre is following her up since they are in liaison with GH STD who are incharge of Vigilance home screening now.

### **Future Plans**

Efforts are being made to step up the number of cases to be screened in the forthcoming year. A consolidated number of 500 samples per month from all areas of HRG and clinically suspected cases is being attempted and same to be achieved.

The role of the Headquarters hospitals and mofussil hospitals in sending samples to the AIDS Cell and then to the centre is also being looked into to enhance the sero surveillance for AIDS in Madras. Attempts are being made to educate the medical, paramedical and other personnel.

Now with regard to our previous experience at the Centre at MMC where work for a year has been done successfully.

After the initial detection of 6 prostitutes who were seropositive in early 1986 work at MMC after the establishment of the Surveillance centre went at a rapid pace - from July 1986 - July 1987. 6230 samples were screened and 33 were confirmed WB positive. Majority of the cases were female prostitutes and were mainly from out of Madras city. They were all brought to the Vigilance home at Santhome Madras, facing charges against prostitution pending court hearing. On an average 30-40 prostitutes are brought per day from various mofussil areas. Hence this has facilitated us in screening them. Since most of them are being a sentence of one year to 2 years of corrective imprisonment follow up has been quite possible.

The year even saw a pregnant seropositive "much publicised" woman who delivered "against all odds" at the Maternity Hospital. The delivery was conducted by Dr. S. Sundararaman and a PG Diploma student Dr. Ashok. The child was a normal healthy 3.2 Kg. boy. The boy has been found to be seronegative and going to celebrate his first birth day on 16th Dec. 1987. The sera of the mother and the child were sent to NIV Pune for a possible virus isolation.

Among the prostitutes at the vigilance home except for a few who had gone on bail grant or not remanded to custody. All of them were followed up for the period ranging from the year to the last case detected on July 1987. Most of them have been screened for infections of several origin and were found to be freed from them.

To Take a Look at Statistics  
July 1986 to July 1987.

No. of samples screened	-	6230
No. of ELISA positive	-	36
Confirmed by WB	-	33
Pending confirmation	-	3

Groups	Screened	ELISA/WB+ve
Promiscous men	3	Nil
Homosexuals	44	"
Eunuchs	1	"
Corrective institution (VH)	783	29
Prostitutes		
IV Drug Users	1	Nil
Blood Donors	1859	"
Recipients	20	Nil
STD OPD	2950	6
Others		
BOH	50	Nil
TB	50	"
Leprosy	50	"
Cancer patients	50	"
Foreigners	369	1

Although many of them insist being taken to GGH once in a month for complaints of cough or non specific complaints they all suffer from the major problem which is psychological. The ambiguity about their possible release from custody has made them feel despondent and are even resorting to hunger strike. Though they have developed an affinity to an ICMR social worker from TRC Madras who spends 4 day a week with them they are very apprehensive towards others. This reveals a very major problem that might definitely pose us which is the psychological and psycho social problem. Moreover slowly gaining more understanding about their seropositive nature and repeatedly because they are bled by various doctors they have now developed distrust on doctors. Some of the women prostitute two of them to be precise from Villupuram reported to us once a month and were followed up.

As far as the six of the STD positive case tracing had become futile. And the foreign student who was the first among the positive Foreign student is presumed to have left the country since the college authorities have no idea of his whereabouts.

Coming to the most delicate of issues, since the STD department alone has now been granted permission by the Director of Vigilance homes because of the various doctors coming to the Vigilance home from various centres following by the Surveillance centres at MMC as far as the VH has come to a standstill.

A method is being worked out to overcome this problem and now as a first step samples from VH prostitutes are being collected and despatched to the MMC Surveillance centre by the STD Department.

**MADRAS****M. Arulraj**

Madras Medical College, Madras.

THE Centre was started at Madras Medical College, Madras on 1.3.86 with Dr. C.S.Lakshminarayana, M.D., M.Sc., as Principal Investigator and Dr. Suniti Solomon, M.D., as Co-investigator. They continued in this capacity until 29.7.87 when both of them were transferred.

Dr. Angel Arulraj, M.D., the present Director & Professor i/c tookover on 29.7.87. The work done so far is presented in two phases.

From 1.3.86 to 29.7.87 Surveillance centre started in March '86.

Principal Investigator: Dr.G.S. Lakshminarayana upto  
Co-Investigator : Dr. Suniti Solomon 29.7.87

Table 1 : Total No. of samples screened by ELISA for HIV antibodies- 6,230.

Categories screened	Total No.	Positive by ELISA
Promiscuous men	3	Nil
Homosexuals	44	Nil
Eunuchs	1	Nil
Vigilance home inmates	783	29
IV drug users	1	Nil
Recipients of blood/blood products	20	Nil
Blood donors	1859	Nil
STD patients	295	6
Others (Foreign students and		

clinical cases)	569	1
Total	6230	36

Elisa positive samples confirmed by Western blot  
= 34

To be confirmed = 2(STD, Coimbatore).

Dr. Angel Arulraj, Director & professor i/c- Took over on 29.7.87 Insti. of Microbiology, MMC, Madras-3.

Table : 2

Categories screened	Total Nos.	Positive by ELISA
Promiscuous men	Nil	Nil
Homosexual men	Nil	Nil
Blood donors	269	1
STD patients	1482	6
Others (foreign students & clinical cases)	164	4
Total	1915	11

ELISA positive samples confirmed by Western blot-2  
Awaiting confirmation - 9

Out of the 11 positives, 4 were clinical cases and 1 blood donor. Three clinical cases were cases of Non-Hodgkin's Lymphoma. One was the spouse of the case.

The rest of cases were referred from the STD Department of Govt. General Hospital, Madras.

Table 3 Age & Sex distribution of samples screened

Age group	Male	Female	Total
20 and below	494	544	1038
21 - 30	1943	1130	3073
31 - 40	655	287	942
Over 41	343	130	473
Total	3435	2091	5526

Table 4 Age & sex distribution of ELISA positive cases.

Age group	Male	Female	Total
Below 20	-	6	6
21 - 30	5	30	35
31 - 40	1	3	4
41 & above	1	1	2
Total	7	40	47

**MADURAI**

**Ramajayam Mohan, Mallika, Nagalakshi, Nalini, Uma  
Meenakshisundaram, Raghavan, Srivardhini,  
Chandrasekaran, Selvakumr  
Madurai Surveillance Centre for AIDS, Madurai.**

THOUGH Virology Research Laboratory, was taking steps to screen high risk groups for HIV infection during '85 it could succeed to get the ELISA kits only during middle of 1986 due to administrative procedures. The Centre is being supported by Government of Tamilnadu and I.C.M.R/Government of India :

The following investigations which are of diagnostic and prognostic value along with associated conditions are being carried out.

**Nature of Investigations**

1. Screening by ELISA for HIV (Wellcozyme)
2. Comparison of various HIV Kits.
3. Associated conditions:
  - a) VDRL and TPHA
  - b) HBsAg
  - c) CMV
  - d) Parasitic infections
4. Prognostic parameters:
  - a) Immunoglobulin levels
  - b) Subsets of Lymphocytes
5. Cultivation
6. Vector Transmission

3145 samples have been screened for ELISA.

Table 1 : Screening of various groups (Total 3145 cases)

Categories screened	Male	Female	Total Number	ELISA positive	Western blot positive		
					Male	Female	
Heterosexual promiscuous	505	1311	1816	1	28 (Low tit- re -10)	1	38
Refugees/ Repatriates	267	192	459	1	0	1	0
Homosexuals	37	-	37	0	-	0	-
Bisexuals	3	-	3	0	-	0	-
Couple	2	2	4	2	1	2	1
Blood recipients	4	9	13	0	0	0	0
Blood donors	310	27	337	0	0	0	0
Antenatal	-	133	133	-	1	-	1
Children (Yaws)	3	4	7	-	2	0	0
Adults (Yaws)	6	4	10	0	0	0	0
Foreign students	10	2	12	0	0	0	0
Miscellaneous	-	-	314	-	-	-	0

Out of 44 Western Blot positive individuals 10 were Wellcozyme negative. Details are given below.

Table 2. Western blot positive with ELISA negative results.

Category	Lab No.	Repeat ELISA	Repeat W.B.
ELISA-Negative	1007	+	+
	452	-	-
ELISA low titres	381	-	-
	1522	+	-
	684	+	-
	685	+	+
	687	+	-
	112	+	-
ELISA-NNLT LT	113	+	+
ELISA - LT- N	113	+	-

Discrepancy between ELISA negative results and Western Blot Positive results were solved by carrying out ELISA test with various kits - Wellcozyme, Abbotts, Electronucleonics. The details are given below:

S.No.	Lab No.	WZ	Abb	EN	W.B.pattern
1.	112	LT4	LT1,P3	P4	P24,41,31,51 GP120,160
2.	113	LT2,N2	N2,LT1, P1	LT4	P24,41,31,55 66,17,51, GP120,160.
3.	381	LT	LT	LT	P24, 41
4.	452	LT1	--	--	P24, 41
5.	684	LT3	P2,LT1	LT3	Awaited
6.	685	LT3	P3	LT3	P24,41,17,31 51,55,66, GP120,160
7.	686	LT2,N1	N3	LT3	Awaited
8.	687	LT3	LT2,P1	LT3	Awaited
9.	1007	N4	LT4	LT4	P24,17,55, GP160 Singapore Reotel Neg.
10.	1522	LT1	P,LT1	LT2	P24,41,17,31 51,55,66, GP120,160

## **Follow up and repeat sample**

Out of 44 Western Blot positives, only 16 could be followed up for repeat sampling as most of them are released under the present law.

### **Repeat Samples tested by ELISA & W.B. (Out of 44 W.B. positive)**

	Repeat samples	ELISA	Western Blot
a.	ELISA (+)& W.B.(+)	8/34	5/34
b.	ELISA(L.T.)& W.B.(+)	8/10	3/10
		16/44	8/44

Through most of them are women, 4 were men and consisting of two couples - one couple were positive and one of the male partners is also positive.

### **Associated Conditions**

(Results for 44 Western Blot positives)

VDRL test : 68% reactive

TPHA test : 72% positive

Hepatitis B surface antigen by ELISA : 5.5% positive

Stool samples were examined for parasitic infection.  
(5/17 +)

### **Prognostic parameters**

a) Estimation of Immunogloublin IgG, IgM, IgA.

Elevated levels of both IgM and IgG have been observed in 28 individuals (63%)

Higher percentage (80%) of individuals with low titre of ELISA but Western Blot positive show a rise in IgM and IgG antibodies.

b) Subsets of lymphocytes.

In six individuals Th (Helper cell) and Ts (Suppressor cells) are almost equal in numbers.

The sensitivity of various kits are given in the following table.

Western Blot Positive Samples compared with Various ELISA Kits as on 31.10.1987.

ELISA Results	WZ	Abb	EN
Samples screened	44	40	40
Positive	34 (77.3%)	37 (93%)	32 (80%)
Low titre	9	2	8
Negative	1	1	0

If low titre (between cut off value and negative) by Wellcozyme and E.N. is taken as positive, sensitivity is comparable with Western Blot. However Abbotts (second generation) is more sensitive.

One woman (Manimegalai A1007) who was repeatedly ELISA negative and Western Blot positive initially has now turned out to be Western Blot also negative.

Two children were ELISA positive, but Western Blot negative, three women were ELISA low titre positive

but Western Blot negative also have also been observed.

WB Negative with variable ELISA Results (WZ).

Category	Lab. No.	Repeat ELISA	Repeat WB
ELISA positive & + WB Negatives	2409	-	-
	2413	-	-
ELISA low titre + WB negative	928	+	+
	153	+	+
	1106	+	-
ELISA low titre WB result awaited	1219	-	Awaited

## **Cultivation of HIV**

Direct cultivation, co-cultivation including cultivation in established cell lines are under progress for 19 with 4 repeat samples. Facilities for identification various para-meters are required - proposal has been submitted for financial assistance (including training at NIH U.S.A.) from I.C.M.R. and Government of India, and the same is awaited.

## **Transmission of HIV by mosquitoes**

Antibodies have been demonstrated in the blood samples of mosquitoes which have bitten the HIV positive individuals.

Due to lack of antigen kit etc. further work could not progress.

## **Contact tracing**

Two couples have been identified with facilities available and one of them were found to be positive. Proposal has been submitted for financial assistance from WHO for thorough contact studies.

## **Extending the surveillance programme**

Camps have been conducted in different districts covering refugees/repatriates, prostitutes and their contacts, etc., (one male from the repatriate camp was positive and one male contact of the prostitutes, is positive).

Medical Officers and Technicians from different districts are being trained to extend the surveillance

programme.

## **Health education**

- a) Participated in the National Science Sammelan and also in Science exhibition organised by Madurai University during September-October 1987. Video film and charts were used for educating the public on various aspects of AIDS. Several thousand people were benefitted.
- b) Lectures and discussions were conducted at Madurai and Theni with medical Officers under the auspices of Indian Medical Association.
- c) Lecture was given on AIDS to the participants throughout India, of workshop on 'Monoclonal antibodies being held at Madurai Kamaraj University, Madurai.
- d) The Dean and Medical Officers of the Medical College hospital have been appraised of the possible transmission of HIV through unsterile and contaminated syringes and needles to the inpatients and outpatients. Disposable syringes and needles has been introduced in few departments. Individual sterile syringe and needle are initiated for the injection room.
- e) Public health authorities have been advised regarding the possible transmission of AIDS virus during immunisation programme.

**NEW DELHI**

**Vinay Sharma & A. Varghese**  
Microbiology Department,  
Maulana Azad Medical College, New Delhi.

**Activities from June 1986—May1987**

- 1) In June, 86, ninety-eight sera were collected from Nari Niketan, Delhi and Sent to N.I.C.D. for detection of HIV antibody. All sere were reported to be negative.
- 2) In July-August, 1986, three hundred & twenty eight sera were collected from Central Jail, Tihar inmates and sent to N.I.C.D. for serology of AIV. All these samples were found to be negative.
- 3) One day symposia were held on AIDS at our Medical College and at LNJP Hospital in the months of October & November, '86. A radio talk on AIDS was also delivered by Professor A. Varghese.
- 4) After standardising the ELISA test at the department, two hundred and forty-two sera of V.D.R.L. positive cases (constituting a high risk group for AIDS) were tested by us. All sera were found to be negative.
- 5) Four sera from foreign students studying in this medical college were also tested and found negative.

## Activities from June 1987 to till date

- 1) Sera from 30 foreign students were collected by us. Of these four students had been sent to us by Rajasthan University, 18 foreign students were from Indian Agricultural Research Institute, New Delhi and remaining 8 from other institutions. All the sera were found to be negative and the reports have been sent to the respective institutions.
- 2) As quality control checks of the AIDS surveillance centre at our college, we were asked by I.C.M.R. to send 14 sera (picked up at random) to AIIMS, New Delhi. These sera had been tested by last year and found negative for HIV antibody.
- 3) Forty-eight V.D.R.L. positive sera have been collected and tested for HIV antibody in the first week of November, 87. All have been found to be negative.

The table summarises the activities of our centre.

Group	Sex	Age group (Years)			
tested		20	21-30	31-40	41+
STD patients					
VDRL positive	M	40	128	31	15
	F	13	60	03	0
Foreign Students.	M	8	20	0	0
	F	2	04	0	0
Total.	(324)	63	212	34	15

All samples were found to be negative for HIV antibody so far.

**PATNA****A.K. Gupta & R. Saran**

Rajendra Memorial Research Institute of Medical Science (ICMR), Agamkuan, Patna.

THE AIDS Surveillance Centre at this Institute started functioning in 1986 when 70 sera samples were screened for antibodies against HTLV-III and it picked up momentum in 1987 with the examination of 617 further sera samples. ELISA test for detection of antibodies to HTLV - III is performed routinely with the help of Wellcozyme anti - HTLV - III kit (Wellcozyme).

Age and sex distribution of persons whose sera were screened is shown in Table 1. The categories of persons whose sera were examined is shown in Table 2. Total of 687 sera were examined by ELISA technique for antibodies against HTLV - III and all were found to be negative.

Since the categories of persons examined belonged to professional blood donors (587), hospital patients and their attendants (98) and foreign students (2), it is suggested that Bihar State AIDS Cell be geared up to supply further sera samples from high risk groups, viz. patients with STD, professional blood donors, prisoners from Bihar Jails etc., when a clear picture of prevalence of AIDS emerge in this region.

Table 1. Age and Sex distribution of Persons Screened

Year	20 yrs		21-30		31-40		41+ yrs		Unknown		Total	
	M*	F**	M	F	M	F	M	F	M	F	M	F
1986	23	10	10	6	8	6	3	8	-	-	44	26
1987	68	2	323	4	130	1	3	0	86	0	610	7

\* M = Male, \*\* F = Female

Table 2. Categories of persons screened for HTLV - III antibodies.

Categories	M	F	Total (No.)	ELISA + ve
Indian Blood Donors	587	0	587	Nil
Hospital patients and attendants.	65	33	98	Nil
Foreign Students	1	1	2	Nil

**PANAJI**

**Inderjit Singh**  
**Goa Medical College, Goa.**

THIS Centre became operational in May 1987 after the receipt of ELISA reader and kits from I.C.M.R., New Delhi. Dr. Savio Rodrigues presently lecturer in the Department received training at N.I.C.D., Delhi in ELISA testing. The Goa Government has kindly created the posts of a Demonstrator, 2 Microbiologists, 2 Technicians and 3 'D' group staff.

The first batch of 10 sera was ELISA tested on 21.5.1987. One serum sample belonging to an I.V. Drug addict French man (Patric Phillips) was found positive both at this Centre and at N.I.V., Pune.

The sources of blood samples were decided in a meeting of the Head of the Clinical Departments of the Goa Medical College and the chief of the S.T.D. Department of Directorate of Health Services, Goa Government (in absentia) and following ( high risk ) groups were decided to be ELISA tested for AIDS:

1. I/V Drug abusers.
2. Cases from S.T.D. clinics
  - a) Goa Medical College.
  - b) Directorate of Health Services.
  - c) V.D.R.L. positive cases.
3. Remand Homes/Jails & Vigilance Homes.
4. Port Employees.
5. Foreigners.
  - a) On beaches.
  - b) Students.
6. Hetrosexually promiscuous.
7. Blood donors.

This group constituted the largest single category as by law enacted by Goa Government, it has become compulsory to test each blood donor before his blood is used.

8. Homosexual group.
9. Miscellaneous group

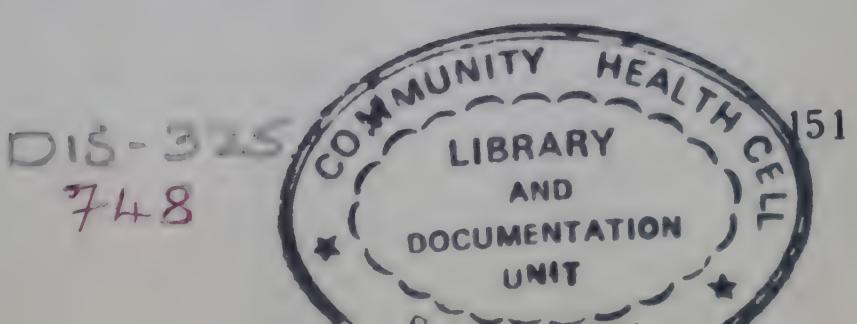
Unless otherwise indicated, ELISA test is put up once a fortnight in a batch of 42 sera with 6 controls in order to minimise the wastage thereby optimising the use of kit.

Out of the 684 (+ 1 serum done on 2 occasions) ELISA tested for AIDS till date, only one belonging to an Intravenous Drug abusing Foreign National (French) admitted with Pneumonia in Goa Medical College has come positive for ELISA. This serum was also confirmed to be ELISA and Western Blot by N.I.V., Pune.

There has not been a single ELISA positive serum thereafter. The largest single group of sera 304 was received from blood bank attached to Goa Medical College because of legal requirement. Even this group did not yield any positive results. This could be due to the fact that the blood donors in Goa are voluntary and there are no professional blood donors.

This low, positivity points to the fact that AIDS infection does not exist in Goa or our sample collection from high risk groups is not proper. Attention will have to be given to this aspect - i.e. proper selection of high risk groups - in future.

It will be interesting to test some of the sera with ELISA kits other than Wellcozyme kit supplied by I.C.M.R. to see if there are any discrepancies.



The detailed findings are given below :

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1. I/V Drug abusers

	Male	Female	Total
	27	1	28
2.	129	75	204 + 3*

3. Remand Homes/Jails Vigilance Homes

	27	5	32
--	----	---	----

4. Port Employees

	5	2	7
--	---	---	---

5. a) Foreigners (on beaches)

	10	6	16
--	----	---	----

b) Foreigners (students)

	10	4	14
--	----	---	----

6. Heterosexually promiscuous

	51	6	57
--	----	---	----

7. Blood Bank

	268	35	303 + 1*
--	-----	----	----------

8. Homosexual

	1	Nil	1
--	---	-----	---

9. Miscellaneous group

	13	5	18
--	----	---	----

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\* Sex not known.

With the exception of only one case - an I/V drug abusing French national who was also confirmed to be both ELISA and Western Blot positive by N.I.V., Pune, no other positive ELISA test result was encountered out of 685 sera tested for AIDS till date. Blood donors (304 cases) constitute the largest single group.

## 6.19

### PONDICHERRY

R.S. Rao

JIPMER, Pondicherry.

THE regional AIDS centre at Pondicherry started functioning from 1st September 1986, at Department of Microbiology, JIPMER, Pondicherry. This centre covers the population of the Union Territory of Pondicherry which includes in addition to the town of Pondicherry, Yanam, Mahe and Karaikal. The Directorate of Health Services, Government of Pondicherry is collaborating in these activities.

#### Surveillance activity

A total of 2000 serum samples were collected from 1st September '86 to 15th October '87. The age and sex wise distribution of the subjects from whom the sera were tested is given in Table 1. Out of the 1619 subjects, 1413 were males (87.2%) and 206 (12.8%) were females. 59 cases were not classified. Maximum number of individuals fall under the age group of 21-30 years.

Table 2 shows source and sex wise distribution of subjects. The sources where the subjects were

Table 1. Age and sex distribution.

Class Interval (yrs)	Males	Females	Total
11 -	67	53	120
21 -	749	90	839
31 -	399	38	437
41 -	164	19	183
51 -	28	6	34
61 -	3	0	3
71 -	3	0	3
<b>Total</b>	<b>1413</b>	<b>206</b>	<b>1619</b>

\* 59 cases were not classified

Table 2 : Source and Sex distribution.

Source	Male	Female	Total
Jail	29	4	33
Vigilance Home	2	0	2
Blood Bank (GH)	523	39	562
Blood Bank (JIPMER)	51	0	51
STD	777	136	913
Foreign Students	18	17	35
Others	58	6	64
<b>Total</b>	<b>1458</b>	<b>202</b>	<b>1660</b>

\* 53 not classified.

Table 3. Geographic distribution of foreign students

S.No.	Name of the country	No. of students
1.	Mauritius	4
2.	Sri Lanka	2
3.	Trinidad	1
4.	Malaysia	11
5.	South Africa	6
6.	Nepal	4
7.	Yemen	2
8.	Tibet	1
9.	Zambia	1
10.	Fiji	2
11.	Iran	1
Total		35*

\* All were found to be negative by ELISA

Table 4 : Details of cases found positive for HIV by ELISA and WB.

S.No.	Lab No.	Age & Sex	ELISA test	Western Blot test
<b>Pondicherry</b>				
1.	581	26/M	+	+
2.	891	22/F	+	+
3.	900	30/M	+	+
4.	927	31/F	+	+
5.	2075	21/F	+	+
6.	1081	36/M	+	+
7.	2150	25/F	+	+
8.	2244	25/F	+	+
<b>Tamil Nadu</b>				
9.	522	21/F	+	+
10.	557	21/M	+	+
11.	683	21/M	+	+
12.	685	30/M	+	+
13.	887	30/F	+	+
14.	1082	42/M	+	+

Table 5 : Source of samples tested.

No.	Reasons	Male	Female	Total
1.	Patient requested	3	0	3
2.	Blood donation (paid or professional donors)	389	1	390
3.	Blood donation (Volunteer donors)	126	26	152
4.	Suspected or confirmed syphilis	119	18	137
5.	Suspected or confirmed gonorrhoea	53	2	55
6.	Other sexually transmitted disease	134	51	185
7.	Homosexual Male	26	0	26
8.	Heterosexually promiscuous male	461	5	466
9.	Heterosexually promiscuous female	2	17	19
10.	Intravenous drug abuser	1	0	1
11.	Suspected AIDS related Complex	2	0	2
12.	Suspected AIDS	3	0	3
13.	Severe or opportunistic infection	4	1	5
14.	Healthy individual, no specific reason	0	0	0
15.	Overseas travel	5	1	6
16.	VDRL positive patient	13	6	19
17.	Haemophiliac, received transfusion factors	7	1	8
18.	Received multiple transfusions	0	0	0
19.	Gross undernutrition	1	0	1
20.	Others	91	35	126
Total		1440	164	1604

contacted were Jail, Vigilance home, blood banks, STD clinics, etc. Majority of subjects screened were from STD clinics and blood banks respectively. Out of 1660 screened, 1458 were males and 202 females.

Table 3 shows geographical distribution of Foreign students screened. 18 males and 17 females were screened. Majority (11) are from Malaysia and one from Zambia.

Table 4 shows the details of cases which were positive for HIV by ELISA and Western Blot. ELISA has been performed on 1700 samples. Out of the 16 ELISA positive cases, 14 were confirmed by Western Blot test. Positivity among sexes were equal. All of them fall in the age group of 21-40 years, majority were heterosexual with multiple partners, screened in STD clinic. One of them was a voluntary blood donor. Among the positive cases 8 are from Union Territory of Pondicherry and 6 from Tamil Nadu area.

Table 5 shows the reasons for submitting the samples. It is seen that out of 1604 samples classified, majority (390) were professional blood donors volunteer donors were only 152. There were 466 heterosexually promiscuous males and 19 females. Only 3 cases were suspected as AIDS and two as AIDS related complex.

**PUNE****K. Pavri & J. Rodrigues**

National Institute of Virology, Pune.

NATIONAL Institute of Virology is not only the ICMR Reference Centre but also the WHO collaborating Centre for AIDS in India. The Centre started functioning in early 1985 but testing could only begin in August, 1985 when kits became available.

The activities of the Centre can be categorised under the following 5 headings.

1. Sero-epidemiological studies.
2. Confirmatory tests on samples and evaluation of kits.
3. Isolation of virus.
4. Arranging Workshops for the demonstration and teaching of techniques.
5. Preventive aspects i.e. through creating awareness by education; and counselling of positive persons.

**Sero-epidemiological Studies**

These studies formed part of surveillance. Among the high risk behaviour's groups, prostitutes were the obvious choice. Hence, special camps were arranged in Goa, Bombay and Miraj for this purpose. The arrangements were made with the help of the State local health authorities. In Pune, samples were collected by one of our Medical Officers from

the STD Clinics of the Government and Cantonment hospitals. Samples from other groups were either collected at the NIV or sera were stored at the NIV. Some samples were obtained from surveillance centres.

The various categories selected for testing are listed in Table 1. This table also gives the results of the ELISA and Western Blot (WB) tests.

On further analysis of the various categories, it can be seen that the number of homosexuals is small. This may be due to the various cultural taboos that may prevent a person admitting this fact. Eunuchs were also included among the homosexuals. The group of heterosexual promiscuous which also contains the prostitutes and those attending the STD Clinics have a number of positive results. However, one difficulty with this group is follow-up of the prostitutes as they change their work areas from time to time.

The "Segregated groups" included three categories who either live in small communities i.e. tribals, those who for some length of time are away from their families and confined among themselves e.g. Navy personnel, and the third category consists of those in prisons. Tribals were chosen to detect if they possessed any cross reacting antigen to any similar virus endemic in the areas. Their sera had been collected previously for arbovirus studies and were stored. There were none positive among them. There were no positives among the Navy personnel. Because of the reported homosexuality in prisons, those prisoners, who were in jail for 3 years and once were tested. There were none positive among the 151 prisoners tested.

There were 2 positive among the 5 intravenous drug

Table 1.

Results of tests on various categories of samples

Category	Number	ELISA positive	WB positive
Homosexuals	32	1	0
Heterosexual (promiscuous)	605(M) 590(F)	4 9	3 7
Segregated groups	1073	0	Nd
Drug users (I/V)	5	2	2
Blood donors	1032	0	ND
Recipients of blood/ blood products	205	1	1
Persons on dialysis	11	0	ND
Persons with symptoms of ARC/AIDS	16	7	7
Miscellaneous (chronic diseases), occupational risk, Risk not known)	764	7	7
Students and foreigners	1961	16	14
Total	6294	47	41

ND - Not done.

WB done only ELISA samples.

users, and both these were foreigners. There were none positive among the 1032 professional blood donors. There was one positive among the recipients of blood products. This person was a haemophiliac who had received factor VIII in Italy. Persons on dialysis also were negative.

### Cases of AIDS/ARC

A large part of the data may be duplicated, as samples from patients with suspected cases have been tested and reported from more than one Centre. Among the samples from these patients received by us there were 7 positive of 15 tested. These patients had received either a blood transfusion or blood product abroad; some of them had lived abroad for many years, and one was a I.V. drug user. One patient had received an blood transfusion in India from a positive donor. The donor has a history of promiscuity. The symptoms and signs of these patients fit in with the clinical discriptions reported abroad. The opportunistic infections have not been fully worked up, but some had candida infections.

The miscellaneous category included the following:

- a) 137 persons who had received the plasma derived hepatitis B Vaccine (Merck Sharpe and Dhome). None of these were positive by ELISA.
- b) 150 patients of lepromatous leprosy. None of whom were positive by ELISA.
- c) Group of persons with chronic diseases not responding to therapy, lymphomas, leukemia, neurological diseases. arboviral infections, hepatitis B positive persons etc. There were

7 positive among a group whose risk status was unknown.

Among the students tested, the positive results were only in Kenyans and Ugandans.

The break-up of all specimens by sex and age is given in Table 2. From this table, it can be seen that the maximum number of samples fall in the age group of 21-30 years. Table 3 gives the break up of all ELISA positive samples by age and sex. Here again the maximum number of samples is in the age group of 21-30 years.

All laboratory workers in the AIDS section are screened every three months for antibodies to HIV.

### **Confirmatory tests on ELISA Positive samples**

A total of 111 WBs were done of which 64 were from samples received from surveillance centres. The WB can no longer be considered a good standard. To facilitate interpretation, we have followed a system of scoring based on the intensity of the bands. eight bands are selected for scoring (p17, p24, p31, gp41, p51, p55, p66, gp120/160). The intensity of the bands is scored as follows: 0 - non reactive; 1 - very weak, 2 - reactive and 3 strongly reactive. A score of 2 or more is considered positive (Nischianian et al. J. Clin. Microbiology (1987) 25: 395). The WB results on foreign students is similar to that of the positive control both in the number and intensity of the bands. It has been noticed that patients with AIDS have very faint p24 bands.

Recently the IgM WB was carried out on 27 ELISA positive samples. 18 of these were positive for p24 IgM. Further studies are in progress.

Table 2 : Age and sex distribution of samples of persons who were screened by ELISA.

Age group	M	F	E+	NK++	Total
20 and below	653	245	0	2	900
21-30	2617	589	2	4	3212
31-40	570	131	4	4	709
41 & above	229	60	1	0	290
Not known	855	129	14	185	1183
<b>Total</b>	<b>4924</b>	<b>1154</b>	<b>21</b>	<b>195</b>	<b>6294</b>

+ Eunuchs

++ Not known.

Table 3: Age and sex distribution of persons whose samples were found positive by ELISA.

Age group	M	F	E+	NK++	Total
20 and below	1	2	0	0	3
21-30	12	9	0	0	21
31-40	2	0	0	0	2
41 and above	3	1	0	0	4
Not known	8	8	1	0	17
<b>Total</b>	<b>26</b>	<b>20</b>	<b>1</b>	<b>0</b>	<b>47</b>

+ Eunuchs

++ Not known

A comparative study of various ELISA kits viz. Wellcome, Abbott EIA, Abbott env/core/EWI and Genetic systems is in progress. The general trend is that there is good correlation between most ELISA kits. However, the Abbott env/core is giving some additional positives which are negative by other ELISA and negative by WB. Further analysis is in progress.

### **Isolation of Virus**

Virus isolation has been attempted in 5 patients. In 2 patients the work is complete, in the remaining the work is in progress.

Isolation is carried out by co-cultivation of the patient's mononuclear cells with the phytohaemagglutinin (PHA) stimulated mononuclear cells from normal persons with appropriate medium and interleukin-2. The cultures are monitored by antigen detection, reverse transcriptase (RT) activity and by electron microscopy.

The first isolate was from an I.V. drug user who was a foreigner. He had symptoms of fever, diarrhoea and weight loss. The cultures were repeatedly positive for antigen. RT activity was present and electron micrographs showed particles with the morphology of HIV.

The second isolate was from one of the Madras prostitute, from her sample collected soon after delivery in December, 1986. This person had fluctuating antibodies as demonstrated by the following :

Sample 1 (Feb. 86) ELISA positive W.B. score 3.

**Sample 2 (Dec. 86) ELISA negative W.B. Score 2  
(faint p24).**

**Sample 3 (July 87) ELISA negative W.B. Score 3  
(p 24, more intense than in Sample 2.)**

The baby is healthy and normal with negative ELISA and WB.

Culture of this sample has shown repeated antigen positive, low RT activity and virus particles with 2 types of morphology on EM.

- a) budding/particle resembling type C particle.
- b) 50-60 nm intracisternal A particles (IAP).

These particles were also detected in the cytoplasm and in the extracellular region.

## **Workshop on Techniques**

Two Workshops have been held at NIV for the teaching and demonstration of the ELISA and W.B. techniques. Lectures on various aspects of AIDS and biosafety have been imparted.

At present the most important aspect is prevention through education and awareness for this purpose; talks have been given in English and in the regional language to the following:

- a) Doctors and Health care workers.
- b) College students.
- c) Social groups like rotary clubs.
- d) Radio talks.

In addition to the work on HIV infection in humans, work on simian retroviruses is in progress.

## ROHTAK

**U. Sabharwal & D.R. Arora**  
 Medical College, Rohtak.

A total of 3381 sera obtained from high risk individuals (homosexuals - 21, promiscuous - 11, jail inmates- 438, drug abusers-9, blood donors-1262, recipients of blood-21, those attending STD clinics-1529, foreign students-82 and foreigner jail inmates-3) and from both males and females of different age groups during the period of Sept. 1986 to Sept., 1987 (Table 1,2 & 3) were studied for the detection of anti HIV (Tables 1 and 2.). Of the total of 3381 cases studied 3291 were Indians and none of them was found to be positive (Table 2). Of the foreigners studied (Table 3) one was found to be positive for anti-HIV. Table 4 shows split up of the 90 foreigners. Of the 2 Yugoslavians studied, one was found to be positive.

Serum sample was collected from 27 year old male Yugoslavian named Mr. Somoyirta on 6.1.1987. ELISA test for the detection of anti HIV was done on 21.1.1987. The test was found positive. It was further confirmed by Western blot test on 5-2-1987 at NICD. The patient was a widower and was lodged in Karnal Jail. He was a drug addict using both oral and parenteral drugs.

On 11.4.1987, he committed suicide by hanging. The postmortem was done in this institution. The viscera studied included brain, thyroid, sternum, thymus, both lungs, heart, liver, gall bladder, spleen, gastrointestinal tract, both kidneys, urinary bladder, prostate, both testes & skin. Pathological findings were obtained in the following organs.

Table 1. Sera screened for HIV from Sept. 86 to Sept. 87.

Sr. No.	Age group (Yrs)	Number studied			Number positive		
		Male	Female	Total	Male	Female	Total
1.	0-20	414	149	563	-	-	-
2.	21-30	1509	490	1999	1(One)	-	1(One)
3.	31-40	537	73	610	-	-	-
4.	41 and above	187	22	209	-	-	-
	Total	2647	734	3381	1	-	1

Table 2 : Category screened (Indian)

Sr. No.	Category	Number studied			Number positive		
		Male	Female	Total	Male	Female	Total
1.	Homosexuals	21	-	21	-	-	-
2.	Promiscuous	11	-	11	-	-	-
3.	Jail Inmates	437	1	438	-	-	-
4.	Drug abusers (I/V)	9	-	9	-	-	-
5.	Blood donors	1198	64	1262	-	-	-
6.	Recipients of blood	15	6	21	-	-	-
7.	STD clinic	877	652	1529	-	-	-
	Total	2568	723	3291	-	-	-

Table 3 : Category screened (foreigners)

Category	Number studied			Number positive		
	Male	Female	Total	Male	Female	Total
Foreign students	82	5	87	-	-	-
Others	3	-	3	1	-	-
Total	85	5	90	1	-	1

Table 4 : Split-up of 90 foreigners studied

Sr. No.	Country	Number screened for HIV	Number positive
1.	Nigeria	45	-
2.	Kenya	14	-
3.	Iran	13	-
4.	Afghanistan	4	-
5.	Bhutan	4	-
6.	Fiji	2	-
7.	Nepal	2	-
8.	Zimbabwe	1	-
9.	Ethiopia	1	-
10.	Lebanon	1	-
11.	Yugoslavia	2	1
12.	Ceylon	1	-
Total		90	1

**Left lung.** showed changes of pulmonary congestion. The basal area of left lung, showed granulomas composed of epithelioid cells, Langhan's and foreign body giant cells with central areas of caseation necrosis. At the periphery these areas were surrounded by lymphocytes. No acid-fast bacillus or fungus could be detected.

**Left hilar lymphnodes** Section from left hilar lymphnodes examined showed changes of granulomatous lymphadenitis. Acid-fast bacillus and fungus could not be detected here too.

**Right lung and right hilar lymphnodes.** Sections from right lung showed changes of pulmonary congestion and oedema-sections from right hilar lymphnodes showed chronic nonspecific reactive lymphadenitis.

### **Mesenteric lymphnodes**

These were enlarged and showed reactive hyperplasia.

**Spleen.** The red pulp areas were congested and showed reticuloendothelial cell hyperplasia. The malpighian corpuscles were grossly small and showed thickened arteriolar walls.

**SRINAGAR****M. Salahuddin**

S.K. Institute of Medical Sciences, Srinagar.

THE ICMR Centre for Sero-Surveillance of HIV infection was established in the Department of Immunology, S.K. Institute of Medical Sciences, Srinagar for screening of high-risk groups in the State of Jammu & Kashmir. The centre started functioning from June, 1986 with the availability of ELISA kits. So far the following high-risk groups were screened by ELISA test.

The jail inmates were screened from both Jammu and Srinagar cities; 13 of these were homosexuals. Recipient of blood/blood products included 14 haemophiliacs. Out of 25 foreign nationals screened, 24 were students from Iran, Nepal, Sudan and 1 UK national coming from Thailand requested for the ELISA test.

The centre has made special efforts to screen the House Boat population of the valley which directly come in contact with the tourist which are predominantly foreign nationals. The category "Others" include those subjects either referred by the clinicians or requested for the test on their own.

All the above subjects were found negative by ELISA test except for 1 in the homosexual category.

The positive ELISA patient had earlier reported in the Gastroenterology OPD of the Institute with complaint of pain in stomach, fever, diarrhoea etc. The subject was 26 year old unmarried male from local population and has been visiting West Germany

S.No.	High-risk groups	Nos.
1.	Homosexual	23 (M-11;Eunuchs-12)
2.	Heterosexually Promiscous	20
3.	Jail inmates	85
4.	Blood Donors	494
5.	Recipient of blood/ Blood products	55
6.	STD Clinic	102
7.	Foreign students + other Nationals	25 (24 + 1)
8.	House Boat Population	352
9.	Others	213
		1369

The age distribution among the above screened subjects was as follows:

Age group	M	F	E	Total
20 & below	106	45	1	152
21-30	645	95	8	748
31-40	298	48	2	348
41 & above	79	23	1	103
Not known	11	7	-	18
	1139	218	12	1369

for business purposes off and on during the previous two years; during this period he stayed there for various length of time. When he reported again on 15th November, 1986, he was very weak, febrile and had developed bilateral pneumonia and candidal oesophagitis. He also gave the history of abnormal sexual behavior. He was hospitalised and kept in isolation. The ELISA test for HIV antibodies came strongly positive which was confirmed by repeat ELISA of the same sample as well as of a separate bleed. The serum sample was immediately sent to All India Institute of Medical Sciences, New Delhi for Western Blot confirmation test. T4/T8 ratio was found to be 0.7 in our laboratory. Later, the patient developed the loss of vision in the right eye. Before the result of confirmation of Western Blot could reach us, the patient died in the Hospital on 30th of November, 1986.

## 6.23

### TIRUPATI

**N. Lakshmi, A. Gururaj Kumar & N.Kuppuswamy**  
S.V. Medical College, Tirupati.

AIDS Surveillance centre was established at the department of Microbiology, S.V. Medical College, Tirupati, Andhra Pradesh, as a part of Nationwide AIDS surveillance programme. This centre undertakes AIDS surveillance in Rayalaseema districts namely Anantapur, Chittoor, Cuddapah and Kurnool districts and Nellore district of Andhra Pradesh.

Surveillance work was started in the month of August, 1986. Initially, 150 samples were collected from 60 professional blood donors, 77 male and 10 female patients attending the STD Clinic and 3

prostitutes. These samples were sent to CMC, Vellore for ELISA test and all were found to be negative for HIV antibodies.

From 1-3-87 ELISA test for AIDS is being done at this centre and as on 31-10-87, 464 samples were collected from 68 professional blood donors, 238 males and 64 females attending the STD clinic, 30 prostitutes, 36 promiscous men, 1 male foreign student, 1 male I.V.Drug addict and 1 homosexual and 21 male and 4 females with Jaundice, and screened at this centre. All these samples were negative for HIV antibodies.

All these 464 samples were also tested for VDRL test and RPHA test for HBsAg. Out of these, 78 samples were positive for HBsAg, 71 samples were weakly reactive and 74 samples were strongly reactive in VDRL test. Syphilis appears to be the prevalent disease among STD Clinic patients and professional blood donors.

Screening of foreign students studying at S.V. University, and sample collection from inmates of district jails and remand homes is under progress.

With further continuation of the surveillance programme it may be likely to detect a few AIDS positive cases at this centre in view of the close proximity of TIRUPATI and Chittoor district to Tamil Nadu, especially Vellore, from where a considerable number of AIDS positive cases were earlier reported.

## TRIVANDRUM

**Mabel Legori**

Medical College, Trivandrum.

THE Surveillance Centre, which is attached to the Department of Microbiology, Medical College, Trivandrum is meant to cater to Kerala and Lakshadweep. However, some foreign students seeking admission to Karnataka Universities come to this centre for sera testing. The centre started functioning from September 1986. Collection of sera was started soon after, and ELISA testing begun from November 1986.

### **ELISA Testing**

The initial 38 samples of sera were tested at CMC Vellore and also at NICD, Delhi. All other samples were tested at this centre.

### **Western Blot Testing**

The ELISA positive sera were tested in duplicates and if still found positive were then sent to CMC Vellore or NICD, Delhi, for retesting by ELISA and, if positive, for confirmation by Western Blot test.

### **Training of Personnel**

To create awareness of HIV infection and to facilitate sera collection, three training courses were conducted. The first one was a one day state level workshop organised on 26th March 1987, for Senior Medical Officers of the Health Services and for

representatives from the Departments of Community Medicine Skin and VD, Infectious Diseases, Microbiology and Blood Bank of the five Medical Colleges in Kerala. The second was a two day workshop held on 21st & 22nd April 1987 for technicians from Lakshadweep. The third was a one day workshop held on 8th June 1987 for skin specialists and/or technicians from the Government Hospitals of ten districts of Kerala. The participants of each district were given all the necessary materials for collecting fifty sera. The kit contained collection vials, storage vials, pasteur pipettes & teats, disposable syringe & needle and AIDS 03 & 04 forms. Continued supply of the collection kits were assured to the participants based on the need and the samples brought to be centre for testing.

## **Surveillance Results**

Detailed break-up of the samples tested are presented in Tables 1,2,3 & 4.

Table 1. Surveillance results as on 30th October 1987

	Indians	Foreigners	Total
Sera Screened	805	149	954
ELISA Positive	*1(0.1%)	**4(2.7%)	5(0.5%)
Western Blot positive	*1(0.1%)	*4(2.7%)	5(0.5%)

\* Male STD Patient, confirmed at NICD & CMC

\*\* The male African students, confirmed at CMC only and one female Italian tourist, jailed for selling Brown Sugar, confirmed at NICD and CMC.

Table 2 : Details of the risk groups screened

INDIANS	M	F	Total	ELISA & WB+ve
STD Patients	120	27	147	*1(0.7%)
Inmates of Corrective Institutions	81	42	123	0
Blood donors	341	3	344	0
Tribals	15	35	50	0
Contacts of W.B. +ve individuals	3	0	3	0
Recipients of blood and blood products	0	1	1	0
HBsAg + ve patients	16	6	22	0
HBsAg negative patients with jaundice	33	19	52	0
? ARC	33	17	50	0
For employment abroad	10	3	13	0
<u>FOREIGNERS</u>				
Students	128	18	146	*3(2.1%)
Tourists	2	1	3	**1(33.3%)
Total	782	172	954	5(0.5%)

\* Male

\*\* Female

**Table 3 : For all samples screened.**

Age group	M	F	Total
20 & below	85	36	121
21 - 30	423	92	515
31 - 40	194	31	225
41 & above	71	13	84
Not known	9	0	9
<b>Total</b>	<b>782</b>	<b>172</b>	<b>954</b>

**Table 4 : For samples found ELISA & W B positive.**

Age group	M	F	Total
20 & below	0	0	
21 - 30	4	1	5
31 - 40	0	0	
41 - above	0	0	
<b>Total</b>	<b>4</b>	<b>1</b>	<b>5</b>

Though the number of samples screened is small, the results obtained indicate the active surveillance of STD patients, foreign students and tourists particularly prone to drug pedling.

**VARANASI**

**T.M. Mohapatra & P.C. Sen**  
**Institute of Medical Sciences, Varanasi.**

DURING the last one year a total of 480 cases were investigated to look for the antibody against HIV.

They were classified as follows :

S.T.D. Clinic	-	350
Blood donors	-	40
Foreign nationals	-	40
Malignancies	-	50

The results are presented below :

Group	No. of sample tested	Antibody +ve
S.T.D. Clinic	350	0
Blood donors	40	0
Foreign nationals	40	0
Malignancies	50	0
Total	480	-

The patients from S.T.D. Clinic were selected from those having history of contact. Blood bank samples consisted of only professional donors. Foreign nationals are the persons who have been deputed by various countries to undertake different courses in the University. Samples from the cases of malignancy were collected from the patients of cancer cervix.

Varanasi being tourist spot, it attracts a lot of foreign nationals round the year. Unconfirmed report says that it is also one of the most important centres for the drug - peddling. This city is also famous for prostitutes.

Attempts were being made to contact the drug addicts and prostitutes. Many a times the addicts asked for money to give blood samples. It was difficult to collect blood from the prostitutes due to various reasons. We have contacted a few social organizations through whom we hope to catch the drug addict, both Indian/foreign citizens. Our efforts to get help from the district administration to collect samples from the prostitutes have failed so far. Perhaps a central direction to the provincial authorities to help us in the matter might be fruitful. We have contacted the District Hospital authorities and we will be getting the samples from the patients with history of contact from V.D. clinic.

## 6.26

### VISAKHAPATNAM

**T.V. Ramani & B. Narasinga Rao,**  
Andhra Medical College, Visakhapatnam.

THE AIDS-surveillance Centre started functioning from 1-8-86 in the Dept. of Microbiology, Andhra Medical College, Visakhapatnam. The centre is sponsored by "Indian Council of Medical Research, New Delhi. This is one of the 3 centres in the State of Andhra Pradesh and is an industrial city with 8 lakhs population and 4 lakhs floating population due to the presence of Port Trust, Hindustan Shipyard which is the biggest ship building unit in India, Steel Project, Bharat Heavy Plates and Vessels, Coromandal

Fertilizers, Hindustan Petroleum Corporation and so many industrial units.

A total of 1078 samples were collected for ELISA in which 914 samples were screened for ELISA at AIDS Reference Centre, Dept. of Virology, C.M.C., Vellore and another 164 samples screened at Dept. of Microbiology, Andhra Medical College, Visakhapatnam till date.

4 camps were conducted during the period in the red light areas, for collection of serum samples from high-risk group people with the help of Social workers and staff of S.T.D. Dept. K.G. hospital, Visakhapatnam.

The analysis is given below :

1. Samples collected till 7.9.87 -- 1078

Samples screened for ELISA -- 1021

2. Sex distribution of the samples :

Male : 902

Female : 176

3. Age distribution of the samples :

Age group	Male	Female	Total
Below 20 years	206	71	277
21 - 30	451	68	519
31 - 40	170	27	197
Above 40 years	75	10	85
Total :	902	176	1078

4. Samples collected from :

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1. S.T.D	:	748
2. Blood Bank	:	240
3. Vigilance Home	:	56
4. I.V. Drug Abusers	:	14
5. Foreign Medical Students		9
6. Others	:	11
Total :		1078

---

Eight ELISA positive cases were retested by AIDS Reference Centre, Dept. of Virology, C.M.C., Vellore and all were western blot negative. We followed the cases and on repetition the serum samples by ELISA, all serum samples turned negative.

C O N C L U S I O N S   A N D  
R E C O M M E N D A T I O N S



## CONCLUSIONS AND RECOMMENDATIONS

1. Sero-surveillance should be continued with special reference to high risk groups which have not been surveillanced so far in great numbers such as ..drug abusers, homosexuals, etc.
2. Surveillance Centres shall continue to use Wellcozyme ELISA kits. Paper for ELISA readers shall be supplied by ICMR.
3. Fluctuating antibody positive samples shall be tested with the repeat samples alongwith the previous sample at the same time, under same test conditions and by same technical person.
4. ELISA testing on the serum sample found ELISA positive should be repeated. If found positive, the second time, sample should be sent to Reference Centre for Western Blot. If ELISA is negative on the second testing on the same sample, it should be declared as negative.
5. To keep a good quality control of the laboratory tests, the referral centres shall exchange coded samples amongst themselves periodically.
6. From the data generated thus for the risk of AIDS transmission through blood donation is almost negligible at the present juncture, hence mandatory testing of all blood donations for HIV antibodies at present is not recommended except for Tamil Nadu. However, surveillance in the professional blood donors shall continue.

7. Blood collection and issuing of certificates to those who are screened for HIV antibodies should be done after affirming the identity of the individual e.g. noting the number of passport in cases of foreigners and taking signatures etc.
8. Sero-positive individuals should be followed and health educated.
9. Laboratory facilities for testing of plasma products for presence of HIV infection should be mandatory with in-built checking.
10. HIV positive individuals/cases should be made reportable to the appropriate health authority.
11. Virus isolation studies should be undertaken at some selected places in the country so that the characterisation into HIV-I/II can be done.
12. The State AIDS cells should be strengthened and good coordination between surveillance centre and State AIDS cells ensured.
13. Age, sex and marital status of the high risk groups screened should always be written.
14. Regular and timely supply of diagnostic kits should be ensured to the surveillance centres.
15. Arrangements for periodic servicing of ELISA equipment at various surveillance centres may be through contractual service.
16. Efforts should be made to collect more sera samples from women high risk groups especially VDRL positive sera.

17. A uniform pattern of staffing for AIDS Surveillance is recommended.
- a) Medical Officer - 1
  - b) Social Worker - 1
  - c) Lab. Technician - 1
  - d) Lab. Attendant - 1

This is essential not only to carry on current activities but also for future increased activities.

18. An in-built on-going training workshop for personnel involved in sero-surveillance of AIDS - including STD Clinic personnel and from Deptt. of medicine, obstetrics, public health personnel may be included in future.
19. Health education activities for AIDS should be strengthened.



## ANNEXURES



## ANNEXURE

### List of Participants

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